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TEXTBOOK TESTBANKS

Test Bank for Precalculus 7th Blitzer

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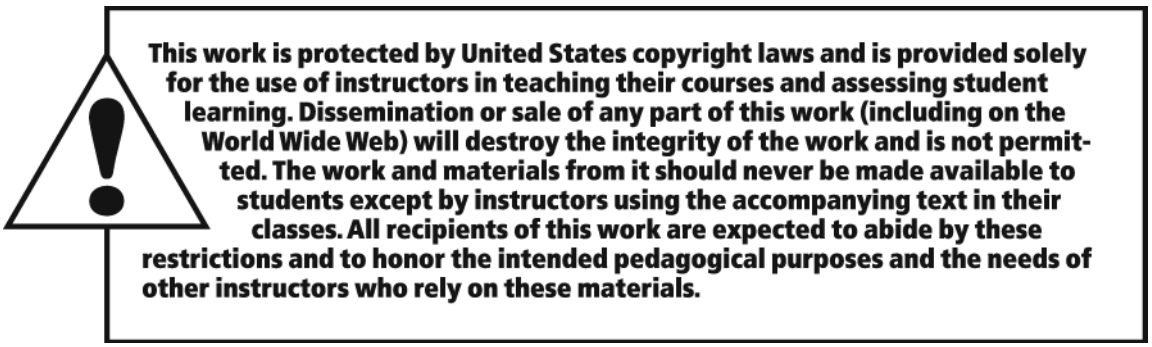

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MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Evaluate the algebraic expression for the given value or values of the variable(s).

1) $8x + 5$; $x = 7$

A) 51 B) 13 C) 61 D) 112

Objective: (0.1) Evaluate Algebraic Expressions

2) $-5x - 9$; $x = -1$

A) 14 B) 4 C) −4 D) −14

Objective: (0.1) Evaluate Algebraic Expressions

3) $3(x + 2) + 8$; $x = -9$

A) 13 B) −40 C) −13 D) 56

Objective: (0.1) Evaluate Algebraic Expressions

4) $6x^2 + 8y$; $x = 4$ and $y = 7$

A) 632 B) 1,008 C) 152 D) 326

Objective: (0.1) Evaluate Algebraic Expressions

5) $(x + 2y)^2$; $x = 3$ and $y = 4$

A) 22 B) 11 C) 25 D) 121

Objective: (0.1) Evaluate Algebraic Expressions

6) $6 + 6(x - 5)^3$; $x = 7$

A) 96 B) 54 C) −42 D) 18

Objective: (0.1) Evaluate Algebraic Expressions

7) $x^2 - 3(x - y)$; $x = 8$ and $y = 2$

A) −82 B) 38 C) 42 D) 46

Objective: (0.1) Evaluate Algebraic Expressions

8) $\frac{9(x - 7)}{2x + 8}$; $x = 5$

A) -1 B) −2 C) 6 D) $-\frac{9}{2}$

Objective: (0.1) Evaluate Algebraic Expressions

9) $\frac{y - 6x}{4x + xy}$; $x = -2$ and $y = 1$

A) $-\frac{1}{2}$ B) $\frac{11}{6}$ C) $-\frac{13}{10}$ D) $\frac{11}{10}$

Objective: (0.1) Evaluate Algebraic Expressions

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Solve.

10) The formula $C = \frac{5}{9}(F - 32)$ expresses the relationship between Fahrenheit temperature, F, and Celsius temperature, C. Use the formula to convert 104°F to its equivalent temperature on the Celsius scale.

A) 76°C B) 40°C C) 8°C D) 130°C

Objective: (0.1) Use Mathematical Models

11) A stone is dropped from a tower that is 760 feet high. The formula $h = 760 - 16t^2$ describes the stone's height above the ground, h, in feet, t seconds after it was dropped. What is the stone's height 5 seconds after it is released?

A) 370 ft B) 360 ft C) 335 ft D) 385 ft

Objective: (0.1) Use Mathematical Models

12) If a rock falls from a height of 60 meters above the ground, the height H (in meters) after x seconds can be approximated using the formula $H = 60 - 4.9x^2$. What is the height of the rock after 2 seconds?

A) –36.04 m B) 50.2 m C) 40.4 m D) 220.4 m

Objective: (0.1) Use Mathematical Models

13) As the relative humidity increases, the temperature seems higher than it is. The formula $T = 0.118x + 77.98$ approximates the apparent temperature for an actual temperature of 85°F, where x is the relative humidity. What is the apparent temperature (to the nearest degree) for a relative humidity of 60%?

A) 78°F B) 85°F C) 138°F D) 552°F

Objective: (0.1) Use Mathematical Models

14) The winning times (in seconds) in a speed–skating event for men can be represented by the formula $T = 46.92 - 0.098x$, where x represents the year, with $x = 0$ corresponding to 1920. (For example in 1992, x would be $1992 - 1920 = 72$.) According to the formula, what was the winning time in 1963? Round to the nearest hundredth.

A) 42.71 sec B) 44.67 sec C) 43.69 sec D) 2,013.35 sec

Objective: (0.1) Use Mathematical Models

15) It is estimated that y, the number of items of a particular commodity (in millions) sold in the United States in year x, where x represents the number of years since 1990, is given by the formula $y = 1.66x + 3.92$. That is, $x = 0$ represents 1990, $x = 1$ represents 1991, and so on. According to the formula, how many items sold in 1999?

A) 3.92 millions B) 50.22 millions C) 20.52 millions D) 18.86 millions

Objective: (0.1) Use Mathematical Models

Find the intersection of the two sets.

16) $\{1, 10, 4, 9\} \cap \{4, 11, 1\}$

A) {1} B) {1, 4} C) {1, 4, 9, 10, 11} D) ∅

Objective: (0.1) Find the Intersection of Two Sets

17) $\{1, 3, 8\} \cap \{4, 11\}$

A) {1, 8} B) {3, 8} C) ∅ D) {1, 4, 8, 3, 11}

Objective: (0.1) Find the Intersection of Two Sets

18) $\{4, 6, 7, 9\} \cap \varnothing$

A) {4, 6, 7, 9} B) {7, 9} C) ∅ D) {4, 6}

Objective: (0.1) Find the Intersection of Two Sets

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Find the union of the two sets.

19) $\{2, 4, 8, 11\} \cup \{2, 4, 13\}$

A) $\{2, 4\}$ B) $\{2, 4, 8, 11, 13\}$ C) $\varnothing$ D) $\{8, 11, 13\}$

Objective: (0.1) Find the Union of Two Sets

20) $\{2, 10\} \cup \{2, 5, 8\}$

A) $\{5, 8, 10\}$ B) $\varnothing$ C) $\{2\}$ D) $\{2, 5, 8, 10\}$

Objective: (0.1) Find the Union of Two Sets

21) $\{8, 10, 11, 13\} \cup \varnothing$

A) $\{8, 10\}$ B) $\varnothing$ C) $\{8, 10, 11, 13\}$ D) $\{11, 13\}$

Objective: (0.1) Find the Union of Two Sets

List all numbers from the given set B that are members of the given Real Number subset.

22) $B = \{11, \sqrt{5}, -8, 0, 0.\overline{8}, \sqrt{9}\}$ Integers

A) 11, 0 B) 11, −8, 0, $\sqrt{9}$ C) 11, −8, 0 D) 11, 0, $\sqrt{9}$

Objective: (0.1) Recognize Subsets of the Real Numbers

23) $B = \{11, \sqrt{6}, -6, 0, 0.\overline{8}, \sqrt{25}\}$ Whole numbers

A) 11, −6, 0 B) 11, −6, 0, $\sqrt{25}$ C) 11, 0 D) 11, 0, $\sqrt{25}$

Objective: (0.1) Recognize Subsets of the Real Numbers

24) $B = \{4, \sqrt{5}, -6, 0, 0.\overline{6}, \sqrt{9}\}$ Natural numbers

A) 4, $\sqrt{9}$ B) 4, 0 C) 4, 0, $\sqrt{9}$ D) 4

Objective: (0.1) Recognize Subsets of the Real Numbers

25) $B = \{17, \sqrt{7}, -12, 0, \frac{1}{2}, \sqrt{16}, 0.\overline{8}, 0.97\}$ Rational numbers

A) 17, 0, $\sqrt{16}$ B) $\sqrt{7}$, $\sqrt{16}$

C) 17, −12, 0, $\frac{1}{2}$, $\sqrt{16}$, 0.97, $0.\overline{8}$ D) $\sqrt{7}$, $\frac{1}{2}$, 0.97

Objective: (0.1) Recognize Subsets of the Real Numbers

26) $B = \{20, \sqrt{8}, -5, 0, \frac{7}{8}, \sqrt{4}, 0.\overline{2}, 0.33\}$ Irrational numbers

A) $\sqrt{8}$, $\sqrt{4}$, $0.\overline{2}$ B) $\sqrt{8}$, $\sqrt{4}$, 0.33 C) $\sqrt{8}$, $0.\overline{2}$ D) $\sqrt{8}$

Objective: (0.1) Recognize Subsets of the Real Numbers

27) $B = \{15, \sqrt{7}, 0, \frac{3}{4}, \sqrt{25}, -0.\overline{9}, 0.1, -9\}$ Real numbers

A) 15, $\sqrt{7}$, 0, $\frac{3}{4}$, $\sqrt{25}$, 0.1 B) 15, $\sqrt{7}$, $\frac{3}{4}$, $\sqrt{25}$, $-0.\overline{9}$, 0.1, −9

C) 15, $\sqrt{7}$, 0, $\frac{3}{4}$, $\sqrt{25}$, $-0.\overline{9}$, 0.1, −9 D) 15, 0, $\frac{3}{4}$, $-0.\overline{9}$, 0.1, −9

Objective: (0.1) Recognize Subsets of the Real Numbers

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Determine whether the statement is true or false.

28) $8 > 15$

A) True B) False

Objective: (0.1) Use Inequality Symbols

29) $10 \geq 3$

A) True B) False

Objective: (0.1) Use Inequality Symbols

30) $-11 < 0$

A) True B) False

Objective: (0.1) Use Inequality Symbols

31) $3 < -3$

A) True B) False

Objective: (0.1) Use Inequality Symbols

32) $10 \leq 8$

A) True B) False

Objective: (0.1) Use Inequality Symbols

33) $-15 \leq 20$

A) False B) True

Objective: (0.1) Use Inequality Symbols

34) $21 > 6$

A) True B) False

Objective: (0.1) Use Inequality Symbols

35) $-18 \geq 21$

A) False B) True

Objective: (0.1) Use Inequality Symbols

36) $-\pi \geq -\pi$

A) True B) False

Objective: (0.1) Use Inequality Symbols

37) $\pi < 3$

A) False B) True

Objective: (0.1) Use Inequality Symbols

Rewrite the expression without absolute value bars.

38) $|16|$

A) 0 B) −16 C) 16 D) 32

Objective: (0.1) Evaluate Absolute Value

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39) $|-13|$

A) 26 B) 13 C) 0 D) −13

Objective: (0.1) Evaluate Absolute Value

40) $\frac{-11}{|-1|}$

A) −1 B) −11 C) 11 D) 1

Objective: (0.1) Evaluate Absolute Value

41) $|\sqrt{5} - 19|$

A) $\sqrt{5} - 19$ B) $19 - \sqrt{5}$ C) −14 D) 14

Objective: (0.1) Evaluate Absolute Value

42) $|7 + (-9)|$

A) 2 B) −2 C) 16 D) −16

Objective: (0.1) Evaluate Absolute Value

43) $||-6| - |-9||$

A) −15 B) −3 C) 15 D) 3

Objective: (0.1) Evaluate Absolute Value

44) $||-2| + |-5||$

A) 3 B) −3 C) −7 D) 7

Objective: (0.1) Evaluate Absolute Value

Evaluate the expression for the given values of x and y.

45) $\frac{|x|}{x} + \frac{|y|}{y}$; $x = 6$ and $y = -4$

A) −1 B) 0 C) 1 D) 2

Objective: (0.1) Evaluate Absolute Value

Express the distance between the given numbers using absolute value. Then find the distance by evaluating the absolute value expression.

46) 12 and 88

A) $|12 - 88| = 76$ B) $-|12 + 88| = -100$ C) $-|88 - 12| = -76$ D) $|12 + 88| = 100$

Objective: (0.1) Use Absolute Value to Express Distance

47) −60 and −5

A) $|(-5) - (-60)| = -55$ B) $|(-5) + (-60)| = -65$ C) $|(-60) - (-5)| = 55$ D) $|-(-60) + (-5)| = 65$

Objective: (0.1) Use Absolute Value to Express Distance

48) 54 and −1

A) $|(-1) - 54| = -55$ B) $|54 - (-1)| = 55$ C) $|-54 + (-1)| = -53$ D) $|54 + (-1)| = 53$

Objective: (0.1) Use Absolute Value to Express Distance

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49) 38.6 and 16.6

A) $|38.6 + 16.6| = 55.2$
B) $|-38.6 + 16.6| = -55.2$
C) $|16.6 - 38.6| = -22.0$
D) $|38.6 - 16.6| = 22.0$

Objective: (0.1) Use Absolute Value to Express Distance

50) −45.6 and 27.8

A) $|27.8 + (-45.6)| = -73.4$
B) $|27.8 - (-45.6)| = -17.8$
C) $|-45.6 + (-27.8)| = 17.8$
D) $|-45.6 - 27.8| = 73.4$

Objective: (0.1) Use Absolute Value to Express Distance

51) 20.8 and 29.6

A) $|29.6 + 20.8| = 50.4$
B) $|20.8 - 29.6| = 8.8$
C) $-|20.8 + 29.6| = -50.4$
D) $|29.6 - 20.8| = -8.8$

Objective: (0.1) Use Absolute Value to Express Distance

State the name of the property illustrated.

52) $9 + (-2) = (-2) + 9$

A) Associative property of addition
B) Identity property of addition
C) Distributive property of multiplication over addition
D) Commutative property of addition

Objective: (0.1) Identify Properties of the Real Numbers

53) $14 \cdot (6 + 2) = 14 \cdot 6 + 14 \cdot 2$

A) Commutative property of multiplication
B) Commutative property of addition
C) Distributive property of multiplication over addition
D) Associative property of multiplication

Objective: (0.1) Identify Properties of the Real Numbers

54) $9 + (21 + 18) = (9 + 21) + 18$

A) Identity property of addition
B) Distributive property of multiplication over addition
C) Commutative property of addition
D) Associative property of addition

Objective: (0.1) Identify Properties of the Real Numbers

55) $(1 + 9) + 2 = (9 + 1) + 2$

A) Inverse property of addition
B) Associative property of addition
C) Commutative property of addition
D) Distributive property of multiplication over addition

Objective: (0.1) Identify Properties of the Real Numbers

56) $4 \cdot (1 \cdot 13) = 4 \cdot (13 \cdot 1)$

A) Identity property of multiplication
B) Associative property of multiplication
C) Distributive property of multiplication over addition
D) Commutative property of multiplication

Objective: (0.1) Identify Properties of the Real Numbers

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57) $(4 + 8) + (6 + 14) = (6 + 14) + (4 + 8)$

A) Distributive property of multiplication over addition
B) Commutative property of addition
C) Associative property of addition
D) Inverse property of addition

Objective: (0.1) Identify Properties of the Real Numbers

58) $3 \cdot (13 \cdot 7) = (13 \cdot 7) \cdot 3$

A) Distributive property of multiplication over addition
B) Commutative property of multiplication
C) Identity property of multiplication
D) Associative property of multiplication

Objective: (0.1) Identify Properties of the Real Numbers

59) $(5 \cdot 18) \cdot 3 = 5 \cdot (18 \cdot 3)$

A) Identity property of multiplication
B) Distributive property of multiplication over addition
C) Associative property of multiplication
D) Commutative property of multiplication

Objective: (0.1) Identify Properties of the Real Numbers

60) $8(x + 3) = 8x + 8 \cdot 3$

A) Distributive property of multiplication over addition
B) Associative property of multiplication
C) Identity property of multiplication
D) Commutative property of multiplication

Objective: (0.1) Identify Properties of the Real Numbers

61) $5(-9 + 8) = -45 + 40$

A) Distributive property of multiplication over addition
B) Associative property of addition
C) Commutative property of multiplication
D) Associative property of multiplication

Objective: (0.1) Identify Properties of the Real Numbers

62) $-5(8 + 2) = -40 + (-10)$

A) Distributive property of multiplication over addition
B) Associative property of addition
C) Associative property of multiplication
D) Commutative property of multiplication

Objective: (0.1) Identify Properties of the Real Numbers

63) $\frac{1}{(x + 4)}(x + 4) = 1, x \neq -4$

A) Commutative property of multiplication
B) Inverse property of multiplication
C) Identity property of multiplication
D) Inverse property of addition

Objective: (0.1) Identify Properties of the Real Numbers

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64) $(x + 2) + [-(x + 2)] = 0$

A) Identity property of multiplication
B) Inverse property of multiplication
C) Inverse property of addition
D) Commutative property of addition

Objective: (0.1) Identify Properties of the Real Numbers

Simplify the algebraic expression.

65) $-9(5r + 10) + 5(4r + 9)$

A) $-4r + 1$ B) $-135r$ C) $-25r + 10$ D) $-25r - 45$

Objective: (0.1) Simplify Algebraic Expressions

66) $(7z + 11) - (4z - 2)$

A) $11z + 13$ B) $3z + 13$ C) $3z + 9$ D) $3z - 13$

Objective: (0.1) Simplify Algebraic Expressions

67) $-5(2x - 9) - 4x + 10$

A) $-14x + 55$ B) $6x + 55$ C) $-14x - 35$ D) $14x + 55$

Objective: (0.1) Simplify Algebraic Expressions

Write the algebraic expression without parentheses.

68) $-(75y)$

A) $75 - y$ B) $-75y$ C) $-75 - y$ D) $75y$

Objective: (0.1) Simplify Algebraic Expressions

69) $-9(5y)$

A) $-45 - 9y$ B) $-45 + y$ C) $-45y$ D) $45y$

Objective: (0.1) Simplify Algebraic Expressions

70) $-(7x - 6)$

A) $42x$ B) $-7x + 6$ C) $-7x - 6$ D) $7x - 6$

Objective: (0.1) Simplify Algebraic Expressions

71) $-(-8 + 9y)$

A) $8 - 9y$ B) $-8 + 9y$ C) $8 + 9y$ D) $72y$

Objective: (0.1) Simplify Algebraic Expressions

72) $-(9z - 8w + 9y)$

A) $-9z - 8w - 9y$ B) $-9z + 8w - 9y$ C) $-9z - 8w + 9y$ D) $-9z + 8w + 9y$

Objective: (0.1) Simplify Algebraic Expressions

73) $\frac{1}{4}(4x) + [(9x) + (-9x)]$

A) 1 B) $-17x$ C) x D) $19x$

Objective: (0.1) Simplify Algebraic Expressions

Evaluate the exponential expression.

74) $2^3 \cdot 7$

A) 56 B) 15 C) 42 D) 2,744

Objective: (0.2) Use Properties of Exponents

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75) $(-4)^3$

A) -12 B) 64 C) -64 D) 12

Objective: (0.2) Use Properties of Exponents

76) -3^3

A) 9 B) -9 C) 27 D) -27

Objective: (0.2) Use Properties of Exponents

77) 5^0

A) -1 B) 5 C) 1 D) 0

Objective: (0.2) Use Properties of Exponents

78) $(-9)^0$

A) 1 B) 9 C) -1 D) 0

Objective: (0.2) Use Properties of Exponents

79) -10^0

A) 10 B) 0 C) -1 D) 1

Objective: (0.2) Use Properties of Exponents

80) 3^{-2}

A) 9 B) $\frac{1}{6}$ C) -9 D) $\frac{1}{9}$

Objective: (0.2) Use Properties of Exponents

81) $(-3)^{-4}$

A) -81 B) $-\frac{1}{81}$ C) 81 D) $\frac{1}{81}$

Objective: (0.2) Use Properties of Exponents

82) -2^{-3}

A) 8 B) $\frac{1}{6}$ C) -8 D) $-\frac{1}{8}$

Objective: (0.2) Use Properties of Exponents

83) $5^7 \cdot 5^2$

A) 5^{14} B) 5^9 C) 25^9 D) 25^{14}

Objective: (0.2) Use Properties of Exponents

84) $(2^4)^3$

A) 24 B) 48 C) 4,096 D) 128

Objective: (0.2) Use Properties of Exponents

85) $(3^4)^{-2}$

A) −162 B) −24 C) $\frac{1}{6{,}561}$ D) $\frac{1}{729}$

Objective: (0.2) Use Properties of Exponents

86) $5^{-3} \cdot 5$

A) $\frac{1}{125}$ B) $\frac{1}{25}$ C) 25 D) 125

Objective: (0.2) Use Properties of Exponents

87) $7^6 \cdot 7^{-7}$

A) −7 B) $\frac{1}{7}$ C) 9.688901041e+10 D) $-\frac{1}{7}$

Objective: (0.2) Use Properties of Exponents

88) $\frac{3^5}{3^4}$

A) $\frac{1}{3}$ B) 3 C) 162 D) $\frac{5}{4}$

Objective: (0.2) Use Properties of Exponents

Simplify the exponential expression.

89) $y \cdot y^6$

A) $2y^7$ B) y^7 C) $2y^6$ D) y^6

Objective: (0.2) Simplify Exponential Expressions

90) $x^{-8}y$

A) $-x^8y$ B) $-\frac{y}{x^8}$ C) $\frac{1}{x^8y}$ D) $\frac{y}{x^8}$

Objective: (0.2) Simplify Exponential Expressions

91) x^7y^0

A) $\frac{1}{x^7}$ B) x^7 C) 0 D) 1

Objective: (0.2) Simplify Exponential Expressions

92) $x^7 \cdot x^5$

A) x^{35} B) 35x C) x^{12} D) 12x

Objective: (0.2) Simplify Exponential Expressions

93) $x^8 \cdot x^{-6}$

A) $-x^2$ B) x^2 C) $\frac{1}{x^2}$ D) $-\frac{1}{x^2}$

Objective: (0.2) Simplify Exponential Expressions

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94) $x^{-8} \cdot x^6$

A) $\frac{1}{x^2}$ B) $-x^2$ C) $-\frac{1}{x^2}$ D) x^2

Objective: (0.2) Simplify Exponential Expressions

95) $(x^3)^5$

A) x^8 B) $5x^{15}$ C) $5x^3$ D) x^{15}

Objective: (0.2) Simplify Exponential Expressions

96) $(x^{-8})^7$

A) $-x^{56}$ B) $-8x^{56}$ C) $\frac{1}{x^{56}}$ D) $-8x^7$

Objective: (0.2) Simplify Exponential Expressions

97) $(x^8)^{-5}$

A) $-x^{40}$ B) $\frac{1}{x^{40}}$ C) $-5x^{40}$ D) $-5x^8$

Objective: (0.2) Simplify Exponential Expressions

98) $(x^{-6})^{-3}$

A) x^{18} B) $-x^9$ C) $\frac{1}{x^9}$ D) $\frac{1}{x^{18}}$

Objective: (0.2) Simplify Exponential Expressions

99) $\frac{x^{15}}{x^9}$

A) x^6 B) x^{10} C) $\frac{1}{x^6}$ D) x^{24}

Objective: (0.2) Simplify Exponential Expressions

100) $\frac{x^4}{x^6}$

A) x^2 B) $\frac{1}{x^2}$ C) $-\frac{1}{x^2}$ D) $-x^2$

Objective: (0.2) Simplify Exponential Expressions

101) $\frac{x^{-6}}{x^4}$

A) $\frac{1}{x^{10}}$ B) x^{10} C) $\frac{1}{x^{24}}$ D) $\frac{1}{x^2}$

Objective: (0.2) Simplify Exponential Expressions

102) $\frac{x^{-3}}{y^{-3}}$

A) $\frac{x^3}{y^3}$ B) x^3y^3 C) $\frac{1}{x^3y^3}$ D) $\frac{y^3}{x^3}$

Objective: (0.2) Simplify Exponential Expressions

103) $(2x)^5$

A) $32x$ B) $10x^5$ C) $32x^5$ D) $10x$

Objective: (0.2) Simplify Exponential Expressions

104) $(-2x)^5$

A) $-32x^5$ B) $-32x$ C) $-10x$ D) $-10x^5$

Objective: (0.2) Simplify Exponential Expressions

105) $(6x^4)^2$

A) $6x^8$ B) $6x^6$ C) $36x^8$ D) $36x^4$

Objective: (0.2) Simplify Exponential Expressions

106) $-5y^0$

A) 0 B) -4 C) 1 D) -5

Objective: (0.2) Simplify Exponential Expressions

107) $(7b)^0$

A) 1 B) b C) 7 D) 0

Objective: (0.2) Simplify Exponential Expressions

108) $(x^8y)^2$

A) $x^{16}y$ B) $x^{10}y$ C) $x^{10}y^3$ D) $x^{16}y^2$

Objective: (0.2) Simplify Exponential Expressions

109) $(-5x^9)(9x^3)$

A) $-45x^{12}$ B) $45x^{27}$ C) $-45x^{27}$ D) $45x^{12}$

Objective: (0.2) Simplify Exponential Expressions

110) $(-9x^6y)(-2x^4y^3)$

A) $18x^{24}y^3$ B) $-18x^{10}y^3$ C) $-11x^{10}y^3$ D) $18x^{10}y^4$

Objective: (0.2) Simplify Exponential Expressions

111) $\frac{6x^9}{x^7}$

A) $12x$ B) $6x^2$ C) $6x^{16}$ D) $36x^2$

Objective: (0.2) Simplify Exponential Expressions

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112) $\frac{-40x^{11}}{5x^2}$

A) $-8x^8$ B) x^9 C) x^8 D) $-8x^9$

Objective: (0.2) Simplify Exponential Expressions

113) $\frac{-36x^4}{9x^{12}}$

A) $\frac{-4}{x^7}$ B) $-4x^7$ C) $\frac{-4}{x^8}$ D) $-4x^8$

Objective: (0.2) Simplify Exponential Expressions

114) $\left(\frac{x}{5}\right)^2$

A) $\frac{x}{5}$ B) $\frac{x^3}{125}$ C) $\frac{x^2}{5}$ D) $\frac{x^2}{25}$

Objective: (0.2) Simplify Exponential Expressions

115) $\left(-\frac{2}{x}\right)^2$

A) $-\frac{4}{x^2}$ B) $\frac{4}{x}$ C) $\frac{4}{x^2}$ D) $\frac{2}{x^2}$

Objective: (0.2) Simplify Exponential Expressions

116) $\left(\frac{x^2}{2}\right)^4$

A) $\frac{x^6}{2}$ B) $\frac{x^8}{16}$ C) $\frac{x^6}{16}$ D) $\frac{x^8}{2}$

Objective: (0.2) Simplify Exponential Expressions

117) $\left(\frac{-3x}{y}\right)^4$

A) $\frac{81x}{y^4}$ B) $\frac{-12x^4}{y^4}$ C) $\frac{-12x}{y}$ D) $\frac{81x^4}{y^4}$

Objective: (0.2) Simplify Exponential Expressions

118) $\frac{x^9y^{12}}{x^4y^2}$

A) xy^{10} B) x^4y^{10} C) x^5y^{10} D) x^4y^9

Objective: (0.2) Simplify Exponential Expressions

119) $\frac{-21x^{12}y^{11}}{3x^2y^4}$

A) $-7x^9y^6$ B) $-7x^9y^{10}$ C) $-7x^{10}y^7$ D) $x^{10}y^7$

Objective: (0.2) Simplify Exponential Expressions

120) x^2y^{-3}

A) $\frac{x^2}{y^3}$ B) $\frac{x^2}{y^{13}}$ C) $y^{13}x^2$ D) y^3x^2

Objective: (0.2) Simplify Exponential Expressions

121) $6x^{-6}y^2$

A) $\frac{y^2}{6x^6}$ B) $\frac{6x^6}{y^2}$ C) $\frac{6y^2}{x^6}$ D) $\frac{6}{x^6y^2}$

Objective: (0.2) Simplify Exponential Expressions

122) $\frac{x^3y^{-3}}{z^{-4}}$

A) $\frac{x^3z^3}{y^4}$ B) $\frac{z^4}{x^3y^3}$ C) $\frac{x^3z^4}{y^3}$ D) $\frac{y^3}{x^3z^4}$

Objective: (0.2) Simplify Exponential Expressions

123) $\frac{20x^8y^{10}}{5x^7y^{-5}}$

A) $4xy^5$ B) $4x^{15}y^{15}$ C) $20xy^{15}$ D) $4xy^{15}$

Objective: (0.2) Simplify Exponential Expressions

124) $\frac{-18x^{11}y^{11}z^{10}}{3x^3y^3z^9}$

A) $-6x^7y^7z$ B) x^8y^8z C) $-6x^8y^8$ D) $-6x^8y^8z$

Objective: (0.2) Simplify Exponential Expressions

125) $\left(\frac{63x^{12}y^{12}}{7x^4y^4}\right)^0$

A) $9x^8y^8$ B) 1 C) x^8y^8 D) 0

Objective: (0.2) Simplify Exponential Expressions

126) $(-4x^4y^7)^2$

A) $-16x^8y^{14}$ B) $16x^8y^{14}$ C) $-4x^8y^{14}$ D) $16x^6y^9$

Objective: (0.2) Simplify Exponential Expressions

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127) $(3x^8)^{-2}$

A) $\frac{1}{9x^{16}}$ B) $\frac{1}{3x^{16}}$ C) $\frac{9}{x^{16}}$ D) $9x^{16}$

Objective: (0.2) Simplify Exponential Expressions

128) $(x^{-5}y^4)^{-2}-2$

A) $\frac{x^{-7}}{y^2}$ B) $\frac{x^{10}}{y^8}$ C) $\frac{1}{x^{10}y^8}$ D) $\frac{y^2}{x^{-7}}$

Objective: (0.2) Simplify Exponential Expressions

129) $(4x^{-3}y^8z^{-2})^{-1}$

A) $\frac{y^9}{4x^4z^3}$ B) $\frac{y^9}{-4x^4z^3}$ C) $\frac{x^3z^2}{4y^8}$ D) $\frac{x^3z^2}{-4y^{-8}}$

Objective: (0.2) Simplify Exponential Expressions

130) $\left(\frac{2x^2y^3}{z^2}\right)^3$

A) $\frac{2x^6y^9}{z^5}$ B) $\frac{8x^6y^9}{z^6}$ C) $\frac{8x^5y^6}{z^5}$ D) $\frac{2x^6y^9}{z^6}$

Objective: (0.2) Simplify Exponential Expressions

131) $\left(\frac{-24x^5y^7}{8x^{11}y^{-2}}\right)^3$

A) $\frac{-27y^{15}}{x^{18}}$ B) $\frac{27y^{27}}{x^{18}}$ C) $\frac{-27}{x^{18}y^{27}}$ D) $\frac{-27y^{27}}{x^{18}}$

Objective: (0.2) Simplify Exponential Expressions

132) $\left(\frac{x^{-2}}{y^4}\right)^{-1}$

A) x^2y^4 B) $\frac{y^3}{x^{-3}}$ C) $\frac{1}{x^2y^4}$ D) $\frac{x^{-3}}{y^3}$

Objective: (0.2) Simplify Exponential Expressions

133) $\left(\frac{2x^3}{y^2}\right)^{-5}$

A) $\frac{32y^{10}}{x^{15}}$ B) $\frac{y^2}{32x^{15}}$ C) $\frac{y^{10}}{32x^{15}}$ D) $\frac{32x^{15}}{y^{10}}$

Objective: (0.2) Simplify Exponential Expressions

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134) $\frac{(4x^4)^3}{x^{15}}$

A) $\frac{64}{x^8}$ B) $\frac{4}{x^3}$ C) $\frac{64}{x^3}$ D) $\frac{64}{x^{27}}$

Objective: (0.2) Simplify Exponential Expressions

135) $(-5x^5y^{-6})(3x^{-1}y)$

A) $\frac{-15x^6}{y^7}$ B) $-15x^4y^7$ C) $\frac{-2x^4}{y^5}$ D) $\frac{-15x^4}{y^5}$

Objective: (0.2) Simplify Exponential Expressions

136) $\frac{3^{-9}x^{-4}y^2}{3^{-6}x^{-7}y^4}$

A) $\frac{27}{x^3y^2}$ B) $\frac{1}{27x^7y^2}$ C) $\frac{x^3}{27y^2}$ D) $\frac{3x^3}{y^2}$

Objective: (0.2) Simplify Exponential Expressions

137) $\left(\frac{xy^5}{x^6y}\right)^{-2}$

A) $\frac{y^8}{x^{10}}$ B) $\frac{x^{10}}{y^8}$ C) $\frac{1}{x^8y^{11}}$ D) $\frac{1}{x^{14}y^{12}}$

Objective: (0.2) Simplify Exponential Expressions

138) $\left(\frac{6x^{-5}y^{-2}z^4}{2xy^{-2}z^{-4}}\right)^{-2}$

A) $\frac{x^8}{9z^{16}}$ B) $\frac{3x^{12}}{z^{16}}$ C) $\frac{x^{12}y^4}{9z^{16}}$ D) $\frac{x^{12}}{9z^{16}}$

Objective: (0.2) Simplify Exponential Expressions

Write the number in decimal notation without the use of exponents.

139) 7×10^{-2}

A) 0.7 B) 0.07 C) 700 D) 70

Objective: (0.2) Use Scientific Notation

140) 7×10^{-3}

A) 7,000 B) 700 C) 0.007 D) 0.07

Objective: (0.2) Use Scientific Notation

141) 6.19×10^3

A) 185.7 B) 619 C) 61,900 D) 6,190

Objective: (0.2) Use Scientific Notation

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142) 2.17×10^{-4}

A) 0.0000217 B) −217,000 C) 0.000217 D) 0.00217

Objective: (0.2) Use Scientific Notation

143) 4.246×10^{-6}

A) 0.00004246 B) 0.0000004246 C) −4,246,000 D) 0.000004246

Objective: (0.2) Use Scientific Notation

144) -1.17×10^{6}

A) 1,170,000 B) −11,700,000 C) −117,000 D) −1,170,000

Objective: (0.2) Use Scientific Notation

145) -8.5961×10^{6}

A) −859,610 B) −85,961,000 C) −515.766 D) −8,596,100

Objective: (0.2) Use Scientific Notation

Write the number in scientific notation.

146) 337

A) 3.37×10^{3} B) 3.37×10^{-2} C) 3.37×10^{1} D) 3.37×10^{2}

Objective: (0.2) Use Scientific Notation

147) 36,000

A) 3.6×10^{4} B) 3.6×10^{-4} C) 3.6×10^{-5} D) 3.6×10^{5}

Objective: (0.2) Use Scientific Notation

148) 77,000,000

A) 7.7×10^{7} B) 7.7×10^{6} C) 7.7×10^{-7} D) 7.7×10^{-6}

Objective: (0.2) Use Scientific Notation

149) 77,477

A) 7.7477×10^{-4} B) 7.7477×10^{5} C) 7.7477×10^{4} D) 7.7477×10^{1}

Objective: (0.2) Use Scientific Notation

150) 0.000169

A) 1.69×10^{-3} B) 1.69×10^{-4} C) 1.69×10^{-5} D) 1.69×10^{4}

Objective: (0.2) Use Scientific Notation

151) 0.00006773

A) 6.773×10^{-5} B) 6.773×10^{5} C) 6.773×10^{4} D) 6.773×10^{-4}

Objective: (0.2) Use Scientific Notation

152) 0.0000000862018

A) 8.62018×10^{-9} B) 8.62018×10^{-7} C) 8.62018×10^{8} D) 8.62018×10^{-8}

Objective: (0.2) Use Scientific Notation

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Perform the indicated computation. Write the answer in scientific notation.

153) $(5 \times 10^{-1})(3.2 \times 10^{7})$

A) 160×10^{6} B) 1.6×10^{7} C) 16×10^{7} D) 1.6×10^{-7}

Objective: (0.2) Use Scientific Notation

154) $(3 \times 10^{9})(1.8 \times 10^{-7})$

A) 5.4×10^{2} B) 5.4×10^{3} C) 5.4×10^{-63} D) 54×10^{2}

Objective: (0.2) Use Scientific Notation

155) $\dfrac{15 \times 10^{5}}{3 \times 10^{-2}}$

A) 10×10^{7} B) 5×10^{7} C) 5×10^{3} D) 10×10^{3}

Objective: (0.2) Use Scientific Notation

156) $\dfrac{19.08 \times 10^{-2}}{4 \times 10^{-5}}$

A) 9.54×10^{3} B) 4.77×10^{3} C) 4.77×10^{-7} D) 9.54×10^{-7}

Objective: (0.2) Use Scientific Notation

157) $\dfrac{19.32 \times 10^{-5}}{4.2 \times 10^{-4}}$

A) 4.6×10^{-1} B) 9.2×10^{-9} C) 9.2×10^{-1} D) 4.6×10^{-9}

Objective: (0.2) Use Scientific Notation

158) $\dfrac{300{,}000{,}000{,}000{,}000}{0.00000005}$

A) 6×10^{20} B) 6×10^{21} C) 25×10^{20} D) 25×10^{21}

Objective: (0.2) Use Scientific Notation

159) $\dfrac{0.00016 \times 0.0003}{0.0008}$

A) 6×10^{-5} B) 48×10^{6} C) 6×10^{5} D) 48×10^{-6}

Objective: (0.2) Use Scientific Notation

Solve. Express the result in scientific notation. If necessary, round the decimal factor to two decimal places.

160) In a state with a population of 9,000,000 people, the average citizen spends $6,000 on housing each year. What is the total spent on housing for the state?

A) $\$54 \times 10^{10}$ B) $\$54 \times 10^{11}$ C) $\$5.4 \times 10^{10}$ D) $\$5.4 \times 10^{9}$

Objective: (0.2) Use Scientific Notation

161) Approximately 4×10^{3} employees of a certain company average $30,000 each year in salary. What is the total amount earned by all the employees of this company per year?

A) $\$1.2 \times 10^{9}$ B) $\$1.2 \times 10^{8}$ C) $\$12 \times 10^{9}$ D) $\$12 \times 10^{8}$

Objective: (0.2) Use Scientific Notation

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Evaluate the expression or indicate that the root is not a real number.

162) $\sqrt{4}$

A) $\frac{1}{4}$ B) 2 C) 16 D) Not a real number

Objective: (0.3) Evaluate Square Roots

163) $-\sqrt{361}$

A) −19 B) −180 C) 19 D) Not a real number

Objective: (0.3) Evaluate Square Roots

164) $\sqrt{-144}$

A) $\frac{12}{144}$ B) 12 C) 20,736 D) Not a real number

Objective: (0.3) Evaluate Square Roots

165) $\sqrt{64 + 36}$

A) 14 B) 10 C) 100 D) $\sqrt{28}$

Objective: (0.3) Evaluate Square Roots

166) $\sqrt{169 - 25}$

A) 17 B) 144 C) $\sqrt{119}$ D) 12

Objective: (0.3) Evaluate Square Roots

167) $\sqrt{16} + \sqrt{9}$

A) 5 B) $\sqrt{7}$ C) 25 D) 7

Objective: (0.3) Evaluate Square Roots

168) $\sqrt{(5)^2}$

A) 5 B) $\frac{1}{25}$ C) 625 D) Not a real number

Objective: (0.3) Simplify Expressions of the Form SqRt(a^2)

169) $\sqrt{(-4)^2}$

A) 4 B) −4 C) 16 D) Not a real number

Objective: (0.3) Simplify Expressions of the Form SqRt(a^2)

Use the product rule to simplify the expression.

170) $\sqrt{147}$

A) 21 B) 12 C) $3\sqrt{7}$ D) $7\sqrt{3}$

Objective: (0.3) Use the Product Rule to Simplify Square Roots

171) $\sqrt{10}$

A) $5\sqrt{2}$ B) $\sqrt{10}$ C) $2\sqrt{5}$ D) 2

Objective: (0.3) Use the Product Rule to Simplify Square Roots

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172) $\sqrt{275}$

A) $\sqrt{275}$ B) 55 C) $25\sqrt{11}$ D) $5\sqrt{11}$

Objective: (0.3) Use the Product Rule to Simplify Square Roots

173) $\sqrt{486x^2}$

A) $6x^2\sqrt{9}$ B) $9\sqrt{6x}$ C) $486x$ D) $9|x|\sqrt{6}$

Objective: (0.3) Use the Product Rule to Simplify Square Roots

174) $\sqrt{98x^2}$

A) $7\sqrt{2}$ B) $7\sqrt{2x^2}$ C) $7x^2\sqrt{2}$ D) $7|x|\sqrt{2}$

Objective: (0.3) Use the Product Rule to Simplify Square Roots

175) $\sqrt{9x} \cdot \sqrt{45x}$

A) $9x^2\sqrt{5}$ B) $9\sqrt{5x^2}$ C) $9|x|\sqrt{5}$ D) $9\sqrt{5x}$

Objective: (0.3) Use the Product Rule to Simplify Square Roots

176) $\sqrt{14x^2} \cdot \sqrt{28x}$

A) $14|x|\sqrt{2x^2}$ B) $14|x|\sqrt{2}$ C) $14x^2\sqrt{2x}$ D) $14|x|\sqrt{2x}$

Objective: (0.3) Use the Product Rule to Simplify Square Roots

Solve the problem.

177) Racing cyclists use the algebraic expression $4\sqrt{x}$ to determine the maximum speed, in miles per hour, to turn a corner of radius x, in feet, without tipping over. Find the maximum speed at which a cyclist should travel around a corner of radius 18 feet without tipping over. Write the answer in simplified radical form.

A) $\frac{4(4+\sqrt{2})}{x}$ miles per hour B) $16+\sqrt{2}$ miles per hour

C) $16\sqrt{2}$ miles per hour D) $12\sqrt{2}$ miles per hour

Objective: (0.3) Use the Product Rule to Simplify Square Roots

178) The formula $v = \sqrt{2.5r}$ models the safe maximum speed, v, in miles per hour, at which a car can travel on a curved road with radius of curvature, r, in feet. A highway crew measures the radius of curvature at an exit ramp as 360 feet. What is the maximum safe speed?

A) 36 miles per hour B) 35 miles per hour C) 30 miles per hour D) 27 miles per hour

Objective: (0.3) Use the Product Rule to Simplify Square Roots

179) The formula $v = \sqrt{20L}$ can be used to estimate the speed of a car, v, in miles per hour, based on the length, L, in feet, of its skid marks upon sudden braking on a dry asphalt road. If a car is involved in an accident and its skid marks measure 61.25 feet, at what estimated speed was the car traveling when it applied its brakes just prior to the accident?

A) 45 miles per hour B) 30 miles per hour C) 40 miles per hour D) 35 miles per hour

Objective: (0.3) Use the Product Rule to Simplify Square Roots

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180) The average height of a boy in the United States, from birth through 60 months, can be modeled by $y = 2.9\sqrt{x} + 20.1$ where y is the average height, in inches, of boys who are x months of age. What would be the expected difference in height between a child 49 months of age and a child 16 months of age?

A) 48.9 inches B) 20.3 inches C) 10.7 inches D) 8.7 inches

Objective: (0.3) Use the Product Rule to Simplify Square Roots

Use the quotient rule to simplify the expression.

181) $\sqrt{\frac{1}{9}}$

A) 9 B) $\frac{1}{81}$ C) $\frac{1}{3}$ D) 3

Objective: (0.3) Use the Quotient Rule to Simplify Square Roots

182) $\sqrt{\frac{4}{9}}$

A) $\frac{2}{3}$ B) $\frac{\sqrt{2}}{3}$ C) 0 D) $\frac{\sqrt{2}}{\sqrt{3}}$

Objective: (0.3) Use the Quotient Rule to Simplify Square Roots

183) $\frac{\sqrt{72x^3}}{\sqrt{2x}}$

A) $6|x|$ B) $6|x|\sqrt{2}$ C) $\frac{6x^2}{\sqrt{2}}$ D) $2x^2$

Objective: (0.3) Use the Quotient Rule to Simplify Square Roots

184) $\frac{\sqrt{144x^4}}{\sqrt{6x}}$

A) $144x^3$ B) $2|x|\sqrt{6x}$ C) $6|x|\sqrt{x}$ D) $\frac{x^2\sqrt{144}}{6}$

Objective: (0.3) Use the Quotient Rule to Simplify Square Roots

Solve the problem.

185) The time, in seconds, that it takes an object to fall a distance d, in feet, is given by the algebraic expression $\sqrt{\frac{d}{16}}$.

Find how long it will take a ball dropped from the top of a building 66 feet tall to hit the ground. Write the answer in simplified radical form.

A) $\frac{\sqrt{66}}{16}$ seconds B) $\frac{8+\sqrt{2}}{4}$ seconds C) $\frac{8\sqrt{2}}{4}$ seconds D) $\frac{\sqrt{66}}{4}$ seconds

Objective: (0.3) Use the Quotient Rule to Simplify Square Roots

Add or subtract terms whenever possible.

186) $3\sqrt{2} - 8\sqrt{2}$

A) $-24\sqrt{4}$ B) $-5\sqrt{2}$ C) $-5\sqrt{4}$ D) $11\sqrt{2}$

Objective: (0.3) Add and Subtract Square Roots

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187) $3\sqrt{3} + 9\sqrt{27}$

A) $12\sqrt{3}$ B) $30\sqrt{3}$ C) $-30\sqrt{3}$ D) $24\sqrt{3}$

Objective: (0.3) Add and Subtract Square Roots

188) $9\sqrt{5x} + 4\sqrt{5x}$

A) $5\sqrt{5}$ B) $13\sqrt{5x}$ C) $36\sqrt{10x}$ D) $13x\sqrt{10}$

Objective: (0.3) Add and Subtract Square Roots

189) $7\sqrt{3} - 5\sqrt{75}$

A) $18\sqrt{3}$ B) $-32\sqrt{3}$ C) $-18\sqrt{3}$ D) $2\sqrt{3}$

Objective: (0.3) Add and Subtract Square Roots

190) $6\sqrt{20} + 4\sqrt{80} - 3\sqrt{125}$

A) $-57\sqrt{5}$ B) $13\sqrt{5}$ C) $57\sqrt{5}$ D) $6\sqrt{5}$

Objective: (0.3) Add and Subtract Square Roots

191) $\sqrt{144} + \sqrt{147} + \sqrt{121} + \sqrt{108}$

A) $85\sqrt{3} + 23$ B) $13\sqrt{3} + \sqrt{144} + \sqrt{121}$

C) $13\sqrt{3} + 23$ D) $\sqrt{147} + \sqrt{108} + 23$

Objective: (0.3) Add and Subtract Square Roots

192) $\sqrt{2x} - 7\sqrt{32x} - 7\sqrt{50x}$

A) $-62\sqrt{2x}$ B) $-14\sqrt{84x}$ C) $-62\sqrt{84x}$ D) $-14\sqrt{2x}$

Objective: (0.3) Add and Subtract Square Roots

Rationalize the denominator.

193) $\frac{1}{\sqrt{2}}$

A) $\frac{1+\sqrt{2}}{2}$ B) $\frac{\sqrt{2}}{2}$ C) $\sqrt{2}$ D) $1 + \sqrt{2}$

Objective: (0.3) Rationalize Denominators

194) $\frac{23}{\sqrt{23}}$

A) 23 B) $\sqrt{23}$ C) 1 D) $23\sqrt{23}$

Objective: (0.3) Rationalize Denominators

195) $\frac{\sqrt{25}}{\sqrt{7}}$

A) 54 B) $\frac{5\sqrt{7}}{7}$ C) $5\sqrt{7}$ D) $\frac{25\sqrt{7}}{7}$

Objective: (0.3) Rationalize Denominators

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196) $\frac{\sqrt{4}}{\sqrt{3}}$

A) 11 B) $2\sqrt{3}$ C) $\frac{4\sqrt{3}}{3}$ D) $\frac{2\sqrt{3}}{3}$

Objective: (0.3) Rationalize Denominators

197) $\frac{\sqrt{5}}{\sqrt{3}}$

A) $\sqrt{5}$ B) $\sqrt{15}$ C) $\frac{\sqrt{15}}{3}$ D) $\frac{\sqrt{15}}{9}$

Objective: (0.3) Rationalize Denominators

198) $\frac{7}{8-\sqrt{6}}$

A) $\frac{56-7\sqrt{6}}{58}$ B) $\frac{7}{8}-\frac{7}{\sqrt{6}}$ C) $\frac{56+7\sqrt{6}}{58}$ D) $\frac{56+7\sqrt{6}}{2}$

Objective: (0.3) Rationalize Denominators

199) $\frac{\sqrt{6}}{\sqrt{17}+2}$

A) $\frac{\sqrt{102}-2\sqrt{6}}{19}$ B) $\frac{3\sqrt{102}+17\sqrt{34}}{6}$ C) $\frac{\sqrt{102}+2\sqrt{6}}{13}$ D) $\frac{\sqrt{102}-2\sqrt{6}}{13}$

Objective: (0.3) Rationalize Denominators

200) $\frac{3}{7-\sqrt{2}}$

A) $\frac{21+3\sqrt{2}}{5}$ B) $\frac{21+3\sqrt{2}}{47}$ C) $\frac{3}{7}-\frac{3}{\sqrt{2}}$ D) $\frac{21-3\sqrt{2}}{47}$

Objective: (0.3) Rationalize Denominators

201) $\frac{2}{\sqrt{5}+\sqrt{7}}$

A) $\sqrt{7}-\sqrt{5}$ B) $\sqrt{2}$ C) $\sqrt{7}+\sqrt{5}$ D) $\sqrt{5}-\sqrt{7}$

Objective: (0.3) Rationalize Denominators

Evaluate the radical expressions or indicate that the root is not a real number.

202) $\sqrt[3]{-27}$

A) 3 B) −3 C) −27 D) not a real number

Objective: (0.3) Evaluate and Perform Operations with Higher Roots

203) $\sqrt[3]{(4)^3}$

A) 64 B) −4 C) 4 D) not a real number

Objective: (0.3) Evaluate and Perform Operations with Higher Roots

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204) $\sqrt[4]{10{,}000}$

A) −10 B) 10 C) 10,000 D) not a real number

Objective: (0.3) Evaluate and Perform Operations with Higher Roots

205) $\sqrt[4]{(-5)^4}$

A) 625 B) −5 C) 5 D) not a real number

Objective: (0.3) Evaluate and Perform Operations with Higher Roots

Simplify the radical expression.

206) $\sqrt[3]{x^4}$

A) $x^2\sqrt[3]{x}$ B) $x^2\sqrt[3]{x^2}$ C) $x\sqrt[3]{x^2}$ D) $x\sqrt[3]{x}$

Objective: (0.3) Evaluate and Perform Operations with Higher Roots

207) $\sqrt[3]{10} \cdot \sqrt[3]{4}$

A) $2\sqrt[3]{5}$ B) $\sqrt[3]{40}$ C) $\sqrt[6]{40}$ D) $2\sqrt[3]{10}$

Objective: (0.3) Evaluate and Perform Operations with Higher Roots

Add or subtract terms whenever possible.

208) $5\sqrt[3]{40} + \sqrt[3]{135}$

A) $5\sqrt[3]{175}$ B) $13\sqrt[3]{5}$ C) $8\sqrt[3]{5}$ D) $6\sqrt[3]{175}$

Objective: (0.3) Evaluate and Perform Operations with Higher Roots

209) $y\sqrt[3]{54x} - \sqrt[3]{250xy^3}$

A) $-2y\sqrt[3]{2x}$ B) $y\sqrt[3]{-245xy^3}$ C) $3y\sqrt[3]{2x} - 54\sqrt[3]{2xy^3}$ D) $(y + 1)\sqrt[3]{255}$

Objective: (0.3) Evaluate and Perform Operations with Higher Roots

Evaluate the expression without using a calculator.

210) $121^{1/2}$

A) 5.5 B) 22 C) 11 D) 44

Objective: (0.3) Understand and Use Rational Exponents

211) $81^{1/4}$

A) 3 B) 36 C) 12 D) 243

Objective: (0.3) Understand and Use Rational Exponents

212) $27^{4/3}$

A) 2,187 B) 81 C) 729 D) 243

Objective: (0.3) Understand and Use Rational Exponents

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213) $36^{-3/2}$

A) $\frac{1}{216}$ B) 216 C) −216 D) $-\frac{1}{216}$

Objective: (0.3) Understand and Use Rational Exponents

Simplify using properties of exponents.

214) $(10x^{1/4})(7x^{3/2})$

A) $70x^{1/2}$ B) $70x^{7/3}$ C) $70x^{7/4}$ D) $70x^{1/4}$

Objective: (0.3) Understand and Use Rational Exponents

215) $\frac{28x^{3/4}}{4x^{1/3}}$

A) $7x^{5/4}$ B) $7x^{5/12}$ C) $7x^{1/6}$ D) $24x^{1/6}$

Objective: (0.3) Understand and Use Rational Exponents

216) $(81x^8y^4)^{1/2}$

A) $\frac{9}{2}x^4y^2$ B) $6{,}561x^{16}y^4$ C) $81x^4y^2$ D) $9x^4y^2$

Objective: (0.3) Understand and Use Rational Exponents

Simplify by reducing the index of the radical.

217) $\sqrt[12]{x^9}$

A) $\sqrt[3]{x}$ B) $\sqrt[4]{x^3}$ C) $\sqrt[3]{x^3}$ D) $\sqrt[4]{x}$

Objective: (0.3) Understand and Use Rational Exponents

218) $\sqrt[12]{27x^3}$

A) $\frac{1}{81x}$ B) $\sqrt[3]{3x}$ C) $\sqrt[4]{3x}$ D) $3\sqrt[4]{3x}$

Objective: (0.3) Understand and Use Rational Exponents

Solve the problem.

219) The algebraic expression $0.07d^{3/2}$ describes the duration of a storm, in hours, whose diameter is d miles. Use a calculator to determine the duration of a storm with a diameter of 5 miles. Round to the nearest hundredth.

A) 0.21 hours B) 11.18 hours C) 0.78 hours D) 0.16 hours

Objective: (0.3) Understand and Use Rational Exponents

Is the algebraic expression a polynomial? If it is, write the polynomial in standard form.

220) $4x^{-1} - 7 + 7x$

A) Yes; $7x + 4x^{-1} - 7$ B) No

Objective: (0.4) Understand the Vocabulary of Polynomials

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221) $8x - 1 + 2x^2$

A) Yes; $2x^2 + 8x - 1$ B) No

Objective: (0.4) Understand the Vocabulary of Polynomials

222) $\frac{3x - 5}{x}$

A) Yes; $\frac{5}{x} - 3$ B) No

Objective: (0.4) Understand the Vocabulary of Polynomials

223) $x^2 - x^3 + x^4 + 8$

A) Yes; $x^4 - x^3 + x^2 + 8$ B) No

Objective: (0.4) Understand the Vocabulary of Polynomials

Find the degree of the polynomial.

224) $-3x + 15x^7 - 3$

A) degree 8 B) degree 15 C) degree 7 D) degree −3

Objective: (0.4) Understand the Vocabulary of Polynomials

225) $-5x + 3x^7 + 7x^6 - 20$

A) degree 3 B) degree 6 C) degree 4 D) degree 7

Objective: (0.4) Understand the Vocabulary of Polynomials

226) $-15x^4 - 8x^3 - 3x + 2x^5 + 5$

A) degree −15 B) degree 3 C) degree 5 D) degree 4

Objective: (0.4) Understand the Vocabulary of Polynomials

227) $x^5 - 9x^3y^7 + 11xy - 8x + 4$

A) degree 10 B) degree 17 C) degree −9 D) degree 5

Objective: (0.4) Understand the Vocabulary of Polynomials

Perform the indicated operations. Write the resulting polynomial in standard form.

228) $(5x^6 - 5x^3 - 3x) + (8x^6 + 8x^3 - 3x)$

A) $10x^{10}$ B) $5x^6 + 13x^3 - 8x$ C) $13x + 3x^6 - 6x^3$ D) $13x^6 + 3x^3 - 6x$

Objective: (0.4) Add and Subtract Polynomials

229) $(6x^4 + 5x^3 - 3x^2 - 5) + (6x^4 + 7x^3 - 3x^2 - 2)$

A) $12x^8 + 12x^6 - 6x^4 - 7$ B) $18x^{18} - 7$

C) $2x^4 + 2x^3 + 4x^2 + 11$ D) $12x^4 + 12x^3 - 6x^2 - 7$

Objective: (0.4) Add and Subtract Polynomials

230) $(-7x^5 - 19x^4 - 11) + (3x^5 - 5x^4 + 4)$

A) $-4x^5 + 2x^4 + 15$ B) $-4x^5 - 24x^4 + 15$ C) $-35x^9$ D) $-4x^5 - 24x^4 - 7$

Objective: (0.4) Add and Subtract Polynomials

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231) $(-2x^7 - 5x^6 - 6x^5 - 6) + (5x^7 - 3x^6 - 9x^5 + 4)$

A) $3x^7 + 2x^6 - 3x^5 + 10$
B) $7x^7 + 2x^6 - 3x^5 + 10$
C) $7x^7 + 2x^6 - 3x^5 - 2$
D) $3x^7 - 8x^6 - 15x^5 - 2$

Objective: (0.4) Add and Subtract Polynomials

232) $(6x^7 + 8x^5 + 12) - (3x^7 - 19x^5 - 7)$

A) $3x^7 + 27x^5 + 19$
B) $3x^7 + 27x^5 + 5$
C) $49x^{12}$
D) $3x^7 + 11x^5 + 5$

Objective: (0.4) Add and Subtract Polynomials

233) $(6x^9 + 5x^8 - 3x^7 + 3) - (3x^9 - 3x^8 + 8x^7 - 5)$

A) $9x^9 + 2x^8 + 5x^7 + 8$
B) $9x^9 + 2x^8 + 5x^7 - 2$
C) $3x^9 + 2x^8 + 5x^7 - 2$
D) $3x^9 + 8x^8 - 11x^7 + 8$

Objective: (0.4) Add and Subtract Polynomials

234) $(5x^6 - 13x^5 - 7) - (3x^6 - 5x^5 + 5)$

A) $-18x^{11}$
B) $2x^6 - 8x^5 - 2$
C) $2x^6 - 8x^5 - 12$
D) $2x^6 - 10x^5 - 2$

Objective: (0.4) Add and Subtract Polynomials

235) $(3x^2 + 4x + 7) + (2x^2 + 4x + 4) - (5x + 2)$

A) $5x^2 + 3x + 9$
B) $3x^2 + 3x + 13$
C) $5x^2 + 3x + 13$
D) $3x^2 + 3x + 9$

Objective: (0.4) Add and Subtract Polynomials

Find the product.

236) $(x + 3)(x^2 - 3x + 9)$

A) $x^3 - 6x^2 - 6x + 27$
B) $x^3 + 27$
C) $x^3 - 27$
D) $x^3 + 6x^2 + 6x + 27$

Objective: (0.4) Multiply Polynomials

237) $(x - 12)(x^2 + 6x - 5)$

A) $x^3 - 6x^2 - 77x + 60$
B) $x^3 + 18x^2 + 67x - 60$
C) $x^3 + 18x^2 + 77x + 60$
D) $x^3 - 6x^2 - 67x - 60$

Objective: (0.4) Multiply Polynomials

238) $(x + 9)(x^2 + 6x - 7)$

A) $x^3 + 15x^2 + 61x - 63$
B) $x^4 + 9x^3 + 6x^2 + 47x - 63$
C) $x^3 + 15x^2 + 47x - 63$
D) $x^3 + 15x^2 + 61x + 63$

Objective: (0.4) Multiply Polynomials

239) $(x + 9)(5x^2 + 6x + 4)$

A) $5x^3 + 51x^2 + 58x + 36$
B) $270x^4 + 5x^3 + 216x^2 + 36$
C) $5x^3 + 45x^2 + 54x + 36$
D) $50x^3 + 60x^2 + 40x$

Objective: (0.4) Multiply Polynomials

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240) $(7x - 1)(x^2 - 2x + 1)$

A) $7x^3 - 13x^2 + 5x - 1$ B) $7x^3 - 14x^2 + 7x + 1$ C) $7x^3 - 15x^2 + 9x - 1$ D) $7x^3 + 15x^2 - 9x + 1$

Objective: (0.4) Multiply Polynomials

241) $(x - 8)(x + 1)$

A) $x^2 - 7x - 8$ B) $x^2 - 8x - 8$ C) $x^2 - 7x - 7$ D) $x^2 - 8x - 7$

Objective: (0.4) Use FOIL in Polynomial Multiplication

242) $(3x - 8)(x + 11)$

A) $x^2 + 25x + 24$ B) $3x^2 + 25x - 88$ C) $x^2 - 88x + 25$ D) $3x^2 + 24x - 88$

Objective: (0.4) Use FOIL in Polynomial Multiplication

243) $(3x + 8)(8x - 7)$

A) $24x^2 + 43x - 56$ B) $24x^2 + 43x + 43$ C) $11x^2 + 43x - 56$ D) $11x^2 + 43x + 43$

Objective: (0.4) Use FOIL in Polynomial Multiplication

244) $(7x^2 - 5)(5x^2 + 8)$

A) $35x^4 + 31x^2 - 40$ B) $35x^2 + 31x - 40$ C) $35x^4 + 31x^2 + 31$ D) $12x^4 + 31x^2 - 40$

Objective: (0.4) Use FOIL in Polynomial Multiplication

245) $(7x^3 - 4)(x^2 + 4)$

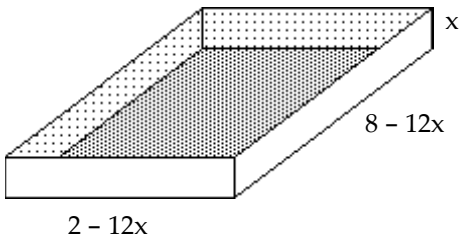
A) $7x^5 + 24x^3 - 16$ B) $7x^6 + 28x^3 - 4x^2 - 16$

C) $7x^5 + 24x^2 - 16$ D) $7x^5 + 28x^3 - 4x^2 - 16$

Objective: (0.4) Use FOIL in Polynomial Multiplication

Solve the problem.

246) Write a polynomial in standard form that represents the volume of the open box.



A) $144x^3 + 120x^2 + 16x$ B) $12x^3 - 120x^2 + 16x$

C) $144x^2 - 120x + 16$ D) $144x^3 - 120x^2 + 16x$

Objective: (0.4) Use FOIL in Polynomial Multiplication

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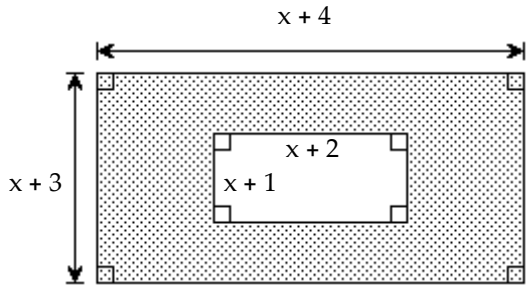
247) Write a polynomial in standard form that represents the area of the shaded region.



A) $10x + 14$ B) $-4x - 10$ C) $x^2 + 9x + 10$ D) $4x + 10$

Objective: (0.4) Use FOIL in Polynomial Multiplication

Find the product.

248) $(x + 10)(x - 10)$

A) $x^2 - 20$ B) $x^2 - 100$ C) $x^2 - 20x - 100$ D) $x^2 + 20x - 100$

Objective: (0.4) Use Special Products in Polynomial Multiplication

249) $(5x + 4)(5x - 4)$

A) $25x^2 - 16$ B) $25x^2 + 40x - 16$ C) $25x^2 - 40x - 16$ D) $x^2 - 16$

Objective: (0.4) Use Special Products in Polynomial Multiplication

250) $(3 + 8x)(3 - 8x)$

A) $64x^2 - 9$ B) $9 - 48x - 64x^2$ C) $9 + 48x - 64x^2$ D) $9 - 64x^2$

Objective: (0.4) Use Special Products in Polynomial Multiplication

251) $(5x^2 + 4x)(5x^2 - 4x)$

A) $10x^4 - 8x^2$ B) $25x^4 + 40x^3 - 16x^2$ C) $25x^4 - 16x^2$ D) $25x^4 - 40x^3 - 16x^2$

Objective: (0.4) Use Special Products in Polynomial Multiplication

252) $(1 + x^5)(1 - x^5)$

A) $1 - x^{10}$ B) $2 - x^{25}$ C) $2 - x^{10}$ D) $1 - x^{25}$

Objective: (0.4) Use Special Products in Polynomial Multiplication

253) $(9 - y^4)(9 + y^4)$

A) $81 - y^4$ B) $81 - y^8$ C) $y^8 - 81$ D) $81 - y^{16}$

Objective: (0.4) Use Special Products in Polynomial Multiplication

254) $(x + 14)^2$

A) $x^2 + 28x + 196$ B) $x + 196$ C) $x^2 + 196$ D) $196x^2 + 28x + 196$

Objective: (0.4) Use Special Products in Polynomial Multiplication

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255) $(x - 7)^2$

A) $49x^2 - 14x + 49$ B) $x + 49$ C) $x^2 - 14x + 49$ D) $x^2 + 49$

Objective: (0.4) Use Special Products in Polynomial Multiplication

256) $(8x + 7)^2$

A) $64x^2 + 49$ B) $64x^2 + 112x + 49$ C) $8x^2 + 49$ D) $8x^2 + 112x + 49$

Objective: (0.4) Use Special Products in Polynomial Multiplication

257) $(9x - 11)^2$

A) $81x^2 - 198x + 121$ B) $9x^2 + 121$ C) $81x^2 + 121$ D) $9x^2 - 198x + 121$

Objective: (0.4) Use Special Products in Polynomial Multiplication

258) $(8x^2 + 5)^2$

A) $64x^4 + 25$ B) $8x^4 + 80x^2 + 25$ C) $64x^4 + 80x^2 + 25$ D) $64x^2 + 80x + 25$

Objective: (0.4) Use Special Products in Polynomial Multiplication

259) $(5x^2 - 3)^2$

A) $25x^4 - 30x^2 + 9$ B) $25x^2 - 30x + 9$ C) $25x^4 - 30x^2 - 9$ D) $25x^4 + 30x^2 + 9$

Objective: (0.4) Use Special Products in Polynomial Multiplication

260) $(7 + 9x)^2$

A) $49x^2 + 126x + 81$ B) $49 + 126x + 81x^2$ C) $49 + 126x + 9x^2$ D) $49 + 81x^2$

Objective: (0.4) Use Special Products in Polynomial Multiplication

261) $(9 - 10x)^2$

A) $81 - 180x - 100x^2$ B) $81x^2 - 180x + 100$ C) $81 - 180x + 100x^2$ D) $81 + 100x^2$

Objective: (0.4) Use Special Products in Polynomial Multiplication

262) $(x - 4)^3$

A) $x^3 - 12x^2 + 24x - 64$ B) $x^3 - 12x^2 + 12x - 64$ C) $x^3 - 12x^2 + 48x - 64$ D) $x^3 - 4x^2 + 24x - 64$

Objective: (0.4) Use Special Products in Polynomial Multiplication

263) $(5x + 4)^3$

A) $125x^3 + 300x^2 + 300x + 64$ B) $125x^3 + 300x^2 + 240x + 64$

C) $25x^2 + 40x + 16$ D) $25x^6 + 20x^3 + 4{,}096$

Objective: (0.4) Use Special Products in Polynomial Multiplication

264) $(3x - 2)^3$

A) $27x^3 + 54x^2 + 36x + 8$ B) $9x^2 - 12x + 4$

C) $27x^3 - 54x^2 + 54x - 8$ D) $27x^3 - 54x^2 + 36x - 8$

Objective: (0.4) Use Special Products in Polynomial Multiplication

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Perform the indicated operations.

265) $(-3x^2y - xy) + (8x^2y + 6xy)$

A) $11x^2y + 5xy$ B) $11x^2y + 7xy$ C) $5x^2y + 7xy$ D) $5x^2y + 5xy$

Objective: (0.4) Perform Operations with Polynomials in Several Variables

266) $(9x^2y - 4xy + 6) + (-8x^2y + 10xy - 3)$

A) $17x^2y + 14xy + 9$ B) $6x^3y^2 + 3$ C) $-x^2y - 14xy + 9$ D) $x^2y + 6xy + 3$

Objective: (0.4) Perform Operations with Polynomials in Several Variables

267) $(11x^4y^2 - 9x^2y^2 + 6xy) + (3x^4y^2 - 10x^2y^2 + 12xy)$

A) $14x^4y^2 - 19x^2y^2 + 18xy$ B) $14x^4y^2 + 19x^2y^2 + 18xy$

C) $-19x^4y^2 + 14x^2y^2 + 18xy$ D) $19x^4y^2 - 14x^2y^2 + 18xy$

Objective: (0.4) Perform Operations with Polynomials in Several Variables

268) $(x^3 + 7xy - 4y^2) - (6x^3 + 4xy + y^2)$

A) $-5x^3 + 3xy - 5y^2$ B) $5x^3 - 3xy - 3y^2$ C) $7x^3 + 3xy - 5y^2$ D) $-5x^3 + 3xy - 3y^2$

Objective: (0.4) Perform Operations with Polynomials in Several Variables

269) $(5x^4 + 3xy - y^3) - (x^4 + 9xy + 3y^3)$

A) $5x^4 - 6xy - 4y^3$ B) $4x^4 - 6xy - 4y^3$ C) $6x^4 + 16xy + 2y^3$ D) $4x^4 - 6xy - 2y^3$

Objective: (0.4) Perform Operations with Polynomials in Several Variables

270) $(10x^4y^2 + 6x^3y + 7y) - (4x^4y^2 + 12x^3y + 11y + 2x)$

A) $6x^4y^2 - 6x^3y - 4y - 2x$ B) $6x^4y^2 - 6x^3y - 4y + 2x$

C) $14x^4y^2 + 18x^3y + 18y + 2x$ D) $6x^4y^2 + 6x^3y - 4y - 2x$

Objective: (0.4) Perform Operations with Polynomials in Several Variables

Find the product.

271) $(x + 10y)(x + 10y)$

A) $x^2 + 20xy + 20y^2$ B) $x + 20xy + 100y$ C) $x^2 + 17xy + 100y^2$ D) $x^2 + 20xy + 100y^2$

Objective: (0.4) Perform Operations with Polynomials in Several Variables

272) $(x - 9y)(3x + 11y)$

A) $x^2 - 16xy - 99y^2$ B) $3x^2 - 16xy - 99y^2$ C) $3x^2 - 16xy - 16y^2$ D) $x^2 - 16xy - 16y^2$

Objective: (0.4) Perform Operations with Polynomials in Several Variables

273) $(5xy + 6)(2xy + 9)$

A) $7x^2y^2 + 57xy + 54$ B) $7x^2y^2 + 57xy + 57$ C) $10x^2y^2 + 57xy + 54$ D) $10x^2y^2 + 57xy + 57$

Objective: (0.4) Perform Operations with Polynomials in Several Variables

274) $(9x + 4y)^2$

A) $9x^2 + 16y^2$ B) $81x^2 + 16y^2$ C) $9x^2 + 72xy + 16y^2$ D) $81x^2 + 72xy + 16y^2$

Objective: (0.4) Perform Operations with Polynomials in Several Variables

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275) $(7x - 9y)^2$

A) $7x^2 + 81y^2$ B) $49x^2 + 81y^2$

C) $7x^2 - 126xy + 81y^2$ D) $49x^2 - 126xy + 81y^2$

Objective: (0.4) Perform Operations with Polynomials in Several Variables

276) $(m - n)(m^2 + mn + n^2)$

A) $m^3 - n^3$ B) $m^3 - 2m^2n - 2mn^2 - n^3$

C) $m^3 + n^3$ D) $m^3 + 2m^2n + 2mn^2 - n^3$

Objective: (0.4) Perform Operations with Polynomials in Several Variables

277) $(x^2y^2 + 2)^2$

A) $x^4y^4 + 2x^2y^2 + 4$ B) $x^2y^2 + 4xy + 4$ C) $x^4y^4 + 4$ D) $x^4y^4 + 4x^2y^2 + 4$

Objective: (0.4) Perform Operations with Polynomials in Several Variables

278) $(4x + 13y)(4x - 13y)$

A) $16x^2 + 104xy - 169y^2$ B) $4x^2 - 13y^2$

C) $16x^2 - 169y^2$ D) $16x^2 - 104xy - 169y^2$

Objective: (0.4) Perform Operations with Polynomials in Several Variables

279) $(5xy^2 - 12y)(5xy^2 + 12y)$

A) $25x^2y^4 - 144y^2$ B) $25x^2y^4 - 120xy^3 - 144y^2$

C) $5x^2y^4 - 12y^2$ D) $25x^2y^4 + 120xy^3 - 144y^2$

Objective: (0.4) Perform Operations with Polynomials in Several Variables

Factor out the greatest common factor.

280) $4x + 20$

A) $4x(5)$ B) $4(x + 5)$ C) $4(x + 20)$ D) $4x(x + 5)$

Objective: (0.5) Factor Out the Greatest Common Factor of a Polynomial

281) $4x^2 - 28x$

A) $4x(x - 7)$ B) $4(x^2 - 7x)$ C) $x(4x - 28)$ D) $4x(x - 7x)$

Objective: (0.5) Factor Out the Greatest Common Factor of a Polynomial

282) $21x^4 - 9x^3 + 12x^2$

A) $3(7x^4 - 3x^3 + 4x^2)$ B) $3x^2(7x^2 - 3x + 4)$ C) $3x(7x^3 - 3x^2 + 4x)$ D) $x^2(21x^2 - 9x + 12)$

Objective: (0.5) Factor Out the Greatest Common Factor of a Polynomial

283) $x(x + 3) + 5(x + 3)$

A) $(x^2 + 3x) + (5x + 15)$ B) $5x(x + 3)$ C) $(x + 3)(x + 5)$ D) $3x(x + 5)$

Objective: (0.5) Factor Out the Greatest Common Factor of a Polynomial

284) $x(5x - 6) + 2(5x - 6)$

A) $2x(5x - 6)$ B) $(5x + 2)(x - 6)$ C) $(5x - 6)(x + 2)$ D) $(5x - 6)(x - 2)$

Objective: (0.5) Factor Out the Greatest Common Factor of a Polynomial

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285) $x^2(x - 6) - (x - 6)$

A) $(x^3 - 6x^2) - (x - 6)$ B) $x^2(x - 6)$ C) $(x - 6)(x^2 + 1)$ D) $(x - 6)(x^2 - 1)$

Objective: (0.5) Factor Out the Greatest Common Factor of a Polynomial

Factor by grouping. Assume any variable exponents represent whole numbers.

286) $x^3 - 3x^2 + 2x - 6$

A) $(x + 3)(x^2 - 2)$ B) $(x - 3)(x^2 + 2)$ C) $(x + 2)(x^2 - 3)$ D) $(x - 3)(x + 2)$

Objective: (0.5) Factor by Grouping

287) $x^3 + 9x + 5x^2 + 45$

A) $(x + 5)(x + 9)$ B) $(x + 5)(x^2 - 9)$ C) $(x - 5)(x^2 + 9)$ D) $(x + 5)(x^2 + 9)$

Objective: (0.5) Factor by Grouping

288) $3x^3 + 6x^2 + 7x + 14$

A) $(x + 2)(3x^2 - 7)$ B) $(x + 2)(3x + 7)$ C) $(x - 2)(3x^2 + 7)$ D) $(x + 2)(3x^2 + 7)$

Objective: (0.5) Factor by Grouping

Factor the trinomial, or state that the trinomial is prime.

289) $x^2 + 15x + 54$

A) $(x - 9)(x + 1)$ B) $(x + 9)(x + 6)$ C) $(x - 9)(x + 6)$ D) prime

Objective: (0.5) Factor Trinomials

290) $x^2 + 11x + 24$

A) $(x - 3)(x + 1)$ B) $(x - 3)(x + 8)$ C) $(x + 3)(x + 8)$ D) prime

Objective: (0.5) Factor Trinomials

291) $x^2 - 4x - 45$

A) $(x - 5)(x + 1)$ B) $(x - 5)(x - 9)$ C) $(x + 5)(x - 9)$ D) prime

Objective: (0.5) Factor Trinomials

292) $x^2 + 6x - 40$

A) $(x - 10)(x + 1)$ B) $(x + 10)(x - 4)$ C) $(x - 10)(x + 4)$ D) prime

Objective: (0.5) Factor Trinomials

293) $x^2 - x - 56$

A) $(x + 7)(x - 8)$ B) $(x + 1)(x - 15)$ C) $(x + 8)(x - 7)$ D) prime

Objective: (0.5) Factor Trinomials

294) $x^2 - x - 54$

A) $(x - 6)(x + 9)$ B) $(x + 6)(x - 9)$ C) $(x - 54)(x + 1)$ D) prime

Objective: (0.5) Factor Trinomials

295) $5x^2 + 47x + 18$

A) $(5x + 9)(x + 2)$ B) $(5x + 2)(5x + 9)$ C) $(5x + 2)(x + 9)$ D) prime

Objective: (0.5) Factor Trinomials

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296) $3x^2 - 23x + 14$

A) $3(x - 2)(x - 7)$ B) $(3x + 7)(x - 2)$ C) $(3x - 2)(x - 7)$ D) $(3x - 2)(3x + 7)$

Objective: (0.5) Factor Trinomials

297) $7x^2 - 16x - 15$

A) $(7x - 3)(x + 5)$ B) $(7x + 5)(x - 3)$ C) $(7x - 5)(x + 3)$ D) prime

Objective: (0.5) Factor Trinomials

298) $7x^2 - 23x + 20$

A) $(7x - 4)(x + 5)$ B) $(7x - 5)(x + 4)$ C) $(7x + 5)(x - 4)$ D) prime

Objective: (0.5) Factor Trinomials

299) $20x^2 + 31x + 12$

A) $(20x + 3)(x + 4)$ B) $(4x - 3)(5x - 4)$ C) $(4x + 3)(5x + 4)$ D) prime

Objective: (0.5) Factor Trinomials

300) $20x^2 - 23x + 6$

A) $(20x + 2)(x + 3)$ B) $(5x - 2)(4x - 3)$ C) $(5x + 2)(4x + 3)$ D) prime

Objective: (0.5) Factor Trinomials

301) $15x^2 + 11x - 12$

A) $(15x + 4)(x - 3)$ B) $(3x + 4)(5x - 3)$ C) $(3x - 4)(5x + 3)$ D) prime

Objective: (0.5) Factor Trinomials

302) $x^2 - 11xy + 24y^2$

A) $(x + 3y)(x - 8y)$ B) $(x - 3y)(x - 8y)$ C) $(x + 3y)(x + y)$ D) prime

Objective: (0.5) Factor Trinomials

303) $7x^2 + 8xy + y^2$

A) $(7x + y)(x + 7y)$ B) $(7x + y)(x + y)$ C) $(7x - y)(x - y)$ D) prime

Objective: (0.5) Factor Trinomials

304) $2x^2 + 3xy - 27y^2$

A) $(2x + 3y)(x - 9y)$ B) $(2x + 9y)(x - 3y)$ C) $y(2x + 9)(x - 3)$ D) prime

Objective: (0.5) Factor Trinomials

305) $9x^2 + 6xy - 8y^2$

A) $(9x - 2y)(x + 4y)$ B) $(3x - 2y)(3x + 4y)$ C) $(3x + 2y)(3x - 4y)$ D) prime

Objective: (0.5) Factor Trinomials

Factor the difference of two squares.

306) $x^2 - 4$

A) $(x - 2)^2$ B) $(x + 2)(x - 2)$ C) $(x + 2)^2$ D) prime

Objective: (0.5) Factor the Difference of Squares

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307) $9x^2 - 49$

A) $(3x + 7)(3x - 7)$ B) $(3x + 7)^2$ C) $(3x - 7)^2$ D) prime

Objective: (0.5) Factor the Difference of Squares

308) $49x^2 - 169y^2$

A) $(7x + 13y)^2$ B) $(7x - 13y)^2$ C) $(7x + 13y)(7x - 13y)$ D) prime

Objective: (0.5) Factor the Difference of Squares

309) $x^4 - 81$

A) $(x^2 + 9)(x^2 + 9)$ B) $(x^2 + 9)(x + 3)(x - 3)$

C) $(x^2 - 9)(x^2 - 9)$ D) prime

Objective: (0.5) Factor the Difference of Squares

310) $(16x^4 - 81)$

A) $(4x^2 + 9)(4x^2 + 9)$ B) $(4x^2 + 9)(4x^2 - 9)$

C) $(4x^2 + 9)(2x + 3)(2x - 3)$ D) $(2x + 3)^2(2x - 3)^2$

Objective: (0.5) Factor the Difference of Squares

Factor the perfect square trinomial.

311) $x^2 - 18x + 81$

A) $(x + 9)^2$ B) $(x - 9)(x + 9)$ C) $(x - 9)^2$ D) prime

Objective: (0.5) Factor Perfect Square Trinomials

312) $x^2 - 15x + 225$

A) $(x + 15)^2$ B) $(x + 15)(x - 15)$ C) $(x - 15)^2$ D) prime

Objective: (0.5) Factor Perfect Square Trinomials

313) $36x^2 + 12x + 1$

A) $(6x + 1)(6x - 1)$ B) $(x + 6)^2$ C) $(6x + 1)^2$ D) prime

Objective: (0.5) Factor Perfect Square Trinomials

Factor using the formula for the sum or difference of two cubes.

314) $x^3 - 27$

A) $(x + 27)(x^2 - 1)$ B) $(x - 3)(x^2 + 3x + 9)$

C) $(x + 3)(x^2 - 3x + 9)$ D) prime

Objective: (0.5) Factor the Sum or Difference of Two Cubes

315) $x^3 + 64$

A) $(x + 4)(x^2 - 4x + 16)$ B) $(x + 4)(x^2 + 16)$

C) $(x - 4)(x^2 + 4x + 16)$ D) prime

Objective: (0.5) Factor the Sum or Difference of Two Cubes

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316) $8x^3 - 1$

A) $(2x + 1)(4x^2 - 2x + 1)$ B) $(2x - 1)(4x^2 + 1)$

C) $(2x - 1)(4x^2 + 2x + 1)$ D) prime

Objective: (0.5) Factor the Sum or Difference of Two Cubes

317) $8x^3 + 1$

A) $(2x - 1)(4x^2 + 1)$ B) $(2x - 1)(4x^2 + 2x + 1)$

C) $(2x + 1)(4x^2 - 2x + 1)$ D) prime

Objective: (0.5) Factor the Sum or Difference of Two Cubes

318) $27x^3 + 8$

A) $(3x + 2)(9x^2 - 6x + 4)$ B) $(3x + 2)(9x^2 + 6x + 4)$

C) $(3x + 2)(9x^2 + 4)$ D) $(3x - 2)(9x^2 + 6x + 4)$

Objective: (0.5) Factor the Sum or Difference of Two Cubes

319) $125x^3 - 27$

A) $(5x - 3)(25x^2 + 15x + 9)$ B) $(5x - 3)(25x^2 + 9)$

C) $(5x - 3)(25x^2 - 15x + 9)$ D) $(5x + 3)(25x^2 - 15x + 9)$

Objective: (0.5) Factor the Sum or Difference of Two Cubes

Factor completely, or state that the polynomial is prime.

320) $11x^3 - 44x$

A) $x(x + 2)(11x - 22)$ B) $11x(x + 2)(x - 2)$ C) $11(x + 2)(x^2 - 2x)$ D) prime

Objective: (0.5) Use a General Strategy for Factoring Polynomials

321) $12x^2 - 147$

A) $3(2x + 7)^2$ B) $3(2x + 7)(2x - 7)$ C) $3(2x - 7)^2$ D) prime

Objective: (0.5) Use a General Strategy for Factoring Polynomials

322) $4x^2 - 24x - 108$

A) $4(x^2 - 6x - 27)$ B) $4(x - 9)(x + 3)$ C) $(4x - 36)(x + 3)$ D) $(x - 9)(4x + 12)$

Objective: (0.5) Use a General Strategy for Factoring Polynomials

323) $4x^4 - 4$

A) $4(x^2 + 1)(x^2 - 1)$ B) $4(x + 1)^2(x - 1)^2$

C) $4(x^2 + 1)(x + 1)(x - 1)$ D) prime

Objective: (0.5) Use a General Strategy for Factoring Polynomials

324) $x^3 - 6x^2 - 25x + 150$

A) $(x + 6)(x + 5)(x - 5)$ B) $(x - 6)(x - 5)^2$ C) $(x - 6)(x + 5)(x - 5)$ D) prime

Objective: (0.5) Use a General Strategy for Factoring Polynomials

325) $5x^2 - 5x - 30$

A) prime B) $5(x + 2)(x - 3)$ C) $(5x + 10)(x - 3)$ D) $5(x - 2)(x + 3)$

Objective: (0.5) Use a General Strategy for Factoring Polynomials

326) $x^3 - 16x$

A) $(x^2 + 4)(x - 4)$ B) $x(x - 4)^2$ C) $x(x + 4)(x - 4)$ D) prime

Objective: (0.5) Use a General Strategy for Factoring Polynomials

327) $25x^3 - 25x$

A) $x(x + 5)(x - 5)$ B) $25x(x^2 - 1)$ C) $25x(x^2 + 1)$ D) $25x(x + 1)(x - 1)$

Objective: (0.5) Use a General Strategy for Factoring Polynomials

328) $x^2 + 100$

A) $(x - 10)^2$ B) $(x + 10)(x - 10)$ C) $(x + 10)^2$ D) prime

Objective: (0.5) Use a General Strategy for Factoring Polynomials

329) $4x^3 - 4$

A) $4(x + 1)(x^2 - x + 1)$ B) $4(x - 1)(x^2 + x + 1)$ C) $4(x^3 - 1)$ D) prime

Objective: (0.5) Use a General Strategy for Factoring Polynomials

330) $2x^3 + 16$

A) $2(x^3 + 8)$ B) $2(x + 2)(x^2 - 2x + 4)$ C) $2(x + 2)^3$ D) prime

Objective: (0.5) Use a General Strategy for Factoring Polynomials

331) $y^5 - 256y$

A) $y(y^2 + 16)(y^2 + 16)$ B) $y(y^2 + 16)(y + 4)(y - 4)$

C) $y(y^2 - 16)(y^2 - 16)$ D) prime

Objective: (0.5) Use a General Strategy for Factoring Polynomials

332) $4x^5 - 4x$

A) $4x(x^2 + 1)(x^2 - 1)$ B) $4x(x^2 + 1)(x + 1)(x - 1)$

C) $4x(x^4 + 1)(x^2 + 1)(x + 1)(x - 1)$ D) prime

Objective: (0.5) Use a General Strategy for Factoring Polynomials

333) $108y^4 - 75y^2$

A) $3y^2(6y + 5)(6y - 5)$ B) $3(6y^2 + 5)(6y^2 - 5)$ C) $3y^2(6y - 5)^2$ D) prime

Objective: (0.5) Use a General Strategy for Factoring Polynomials

334) $16x^2 - 56x + 49 - 25y^2$

A) $(4x + 7 + 5y)(4x + 7 - 5y)$ B) $(4x - 7 + 5y)(4x - 7 - 5y)$

C) $(4x + 7 + 5y)(4x - 7 - 5y)$ D) prime

Objective: (0.5) Use a General Strategy for Factoring Polynomials

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335) $81b^2x - 16y - 16x + 81b^2y$

A) $(9bx - 4y)^2$ B) $(9bx + 4y)(9bx - 4y)$

C) $(9b + 4)(9b - 4)(x + y)$ D) prime

Objective: (0.5) Use a General Strategy for Factoring Polynomials

336) $x^2y - 36y + 144 - 4x^2$

A) $(y - 4)(x + 6)(x - 6)$ B) $(y + 4)(x + 6)(x - 6)$ C) $(y - 4)(x^2 + 36)$ D) prime

Objective: (0.5) Use a General Strategy for Factoring Polynomials

337) $2x^3 - 50a^2x - 16x^2 + 32x$

A) $2x(x - 4 + 5a)(x + 4 + 5a)$ B) $2x(x - 4 + 5a)(x + 4 - 5a)$

C) $2x(x - 4 + 5a)(x - 4 - 5a)$ D) prime

Objective: (0.5) Use a General Strategy for Factoring Polynomials

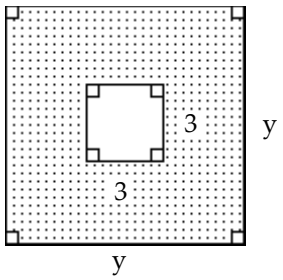
Solve the problem.

338) A department store is having a clearance sale. The price on a television is reduced by 38%. That sale price is then reduced by another 38%. If x is the television's original price, the sale price can be represented by $(x - 0.38x) - 0.38(x - 0.38x)$. With these two reductions, at what percentage of the original price is the television being sold? Use the factored, simplified form of the expression to answer the question.

A) 76% B) 62% C) 24% D) 38.44%

Objective: (0.5) Use a General Strategy for Factoring Polynomials

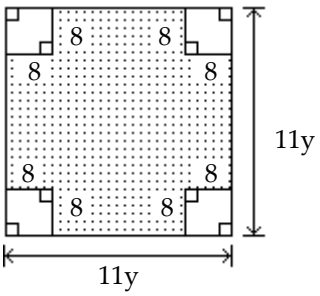
339) Write an expression for the area of the shaded region and express it in factored form.



A) $(y + 3)(y - 3)$ B) $(y + 3)^2$ C) $(y - 3)^2$ D) $y^2 + 9$

Objective: (0.5) Use a General Strategy for Factoring Polynomials

340) Write an expression for the area of the shaded region and express it in factored form.



A) $(11y - 8)^2$ B) $(11y + 8)(11y - 8)$ C) $(11y + 16)(11y - 16)$ D) $(11y - 16)^2$

Objective: (0.5) Use a General Strategy for Factoring Polynomials

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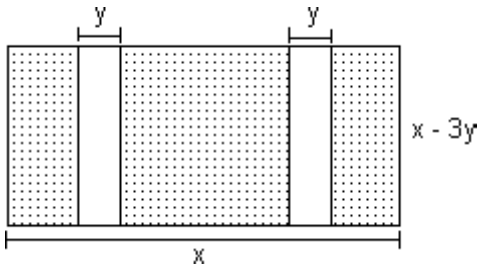
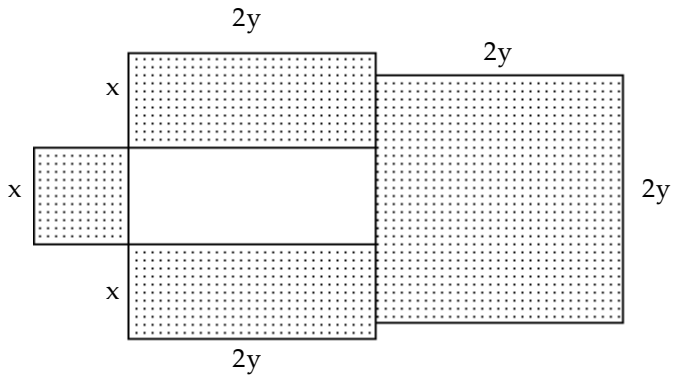
341) Write an expression for the area of the shaded region and express it in factored form.



A) $(x - y)(x - 3y)$ B) $5(x - y)^2$ C) $(x - 2y)(x - 3y)$ D) $(x - 5y)^2$

Objective: (0.5) Use a General Strategy for Factoring Polynomials

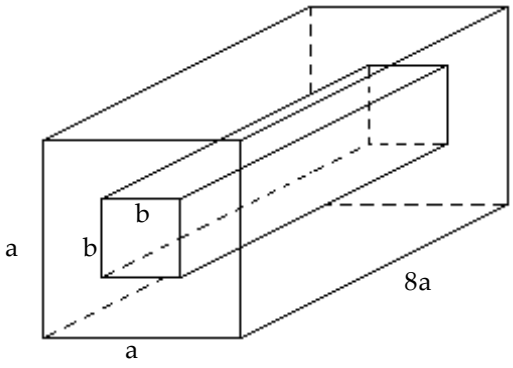
342) Write an expression for the area of the shaded region and express it in factored form.



A) $(x + 2y)^2$ B) $x^2 + 2xy + 4y^2$ C) $x^2 + 4xy + 4y^2$ D) $2(x + y)^2$

Objective: (0.5) Use a General Strategy for Factoring Polynomials

343) Find the formula for the volume of the region outside the smaller rectangular solid and inside the larger rectangular solid. Express the volume in factored form.



A) $8a(a^2 + b^2)$ B) $8a(a + b)(a - b)$ C) $(8a + b)(8a - b)$ D) $8a(a^2 - b^2)$

Objective: (0.5) Use a General Strategy for Factoring Polynomials

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Factor and simplify the algebraic expression.

344) $x^{6/7} - x^{1/7}$

A) $x(x^{5/7} - 1)$ B) $x^{6/7}(1 - x^{5/7})$ C) $x^{1/7}(x^{5/7} - 1)$ D) $x^{1/7}(x^6 - 1)$

Objective: (0.5) Factor Algebraic Expressions Containing Fractional and Negative Exponents

345) $7x^{-4/5} + 28x^{1/5}$

A) $\frac{7(4x + 1)}{x^{4/5}}$ B) $\frac{1 + 7x}{4x^{4/5}}$ C) $\frac{4 + x}{7x^{1/5}}$ D) $\frac{1 + 4x^{1/5}}{7x^{4/5}}$

Objective: (0.5) Factor Algebraic Expressions Containing Fractional and Negative Exponents

346) $(x + 5)^{1/4} + (x + 5)^{3/4}$

A) $(x + 5)^{1/2}(1 + (x + 5)^{3/2})$ B) $(x + 5)^{1/2}((x + 5)^{1/2} + 1)$

C) $(x + 5)^{1/2}(1 + (x + 5)^{1/4})$ D) $(x + 5)^{1/4}(1 + (x + 5)^{1/2})$

Objective: (0.5) Factor Algebraic Expressions Containing Fractional and Negative Exponents

347) $(x + 8)^{2/5} - (x + 8)^{12/5}$

A) $(x + 8)((x + 8)^{2/5} - (x + 8)^{12/5})$ B) $(x + 8)^{2/5}(-x^2 - 16x - 63)$

C) $(x + 8)(-x^2 - 16x + 63)$ D) $(x + 8)^{12/5}((x + 8)^{1/6} - 1)$

Objective: (0.5) Factor Algebraic Expressions Containing Fractional and Negative Exponents

348) $(x + 9)^{-1/5} + (x + 9)^{-6/5}$

A) $(x + 9)^{6/5}(x + 10)$ B) $(x + 9)^{-1/5} + (x + 9)^{-6/5}$

C) $\frac{(x + 10)}{(x+ 9)^{1/5}}$ D) $\frac{(x + 10)}{(x+ 9)^{6/5}}$

Objective: (0.5) Factor Algebraic Expressions Containing Fractional and Negative Exponents

349) $(x + 7)^{-1/3} - (x + 7)^{-2/3}$

A) $\frac{(x+ 7)^{1/3} - 1}{(x+ 7)^{1/3}}$ B) $\frac{x + 6}{(x+ 7)^{2/3}}$

C) $(x + 7)^{-1/3} - (x + 7)^{-2/3}$ D) $\frac{(x+ 7)^{1/3} - 1}{(x+ 7)^{2/3}}$

Objective: (0.5) Factor Algebraic Expressions Containing Fractional and Negative Exponents

Find all numbers that must be excluded from the domain of the rational expression.

350) $\frac{5}{x - 2}$

A) $x \neq 0$ B) $x \neq -2$ C) $x \neq -5$ D) $x \neq 2$

Objective: (0.6) Specify Numbers That Must Be Excluded from the Domain of a Rational Expression

351) $\frac{5}{x + 4}$

A) $x \neq 4$ B) $x \neq 0$ C) $x \neq -5$ D) $x \neq -4$

Objective: (0.6) Specify Numbers That Must Be Excluded from the Domain of a Rational Expression

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352) $\frac{x+2}{x^2-81}$

A) $x \neq 81$ B) $x \neq 9$ C) $x \neq -2$ D) $x \neq 9, x \neq -9$

Objective: (0.6) Specify Numbers That Must Be Excluded from the Domain of a Rational Expression

353) $\frac{x-9}{x^2-36}$

A) $x \neq 6, x \neq -6$ B) $x \neq 6$ C) $x \neq 36$ D) $x \neq \frac{1}{4}$

Objective: (0.6) Specify Numbers That Must Be Excluded from the Domain of a Rational Expression

354) $\frac{x-7}{x^2+9x+14}$

A) $x \neq 0$ B) $x \neq 7, x \neq 2$ C) $x \neq -7, x \neq -2$ D) $x \neq 7$

Objective: (0.6) Specify Numbers That Must Be Excluded from the Domain of a Rational Expression

355) $\frac{x-2}{x^2-3x-10}$

A) $x \neq -5, x \neq 2$ B) $x \neq 0$ C) $x \neq -2, x \neq 5$ D) $x \neq 2$

Objective: (0.6) Specify Numbers That Must Be Excluded from the Domain of a Rational Expression

356) $\frac{x+7}{x^2-12x+35}$

A) $x \neq 5, x \neq 7$ B) $x \neq -5, x \neq -7$ C) $x \neq -7$ D) $x \neq 0$

Objective: (0.6) Specify Numbers That Must Be Excluded from the Domain of a Rational Expression

Simplify the rational expression. Find all numbers that must be excluded from the domain of the simplified rational expression.

357) $\frac{4x+3}{20x^2+23x+6}$

A) $\frac{1}{5x+2}, x \neq -\frac{2}{5}, x \neq -\frac{3}{4}$ B) $\frac{4x+5}{5x+23}, x \neq -\frac{23}{5}$

C) $\frac{4x+3}{20x^2+23x+6}, x \neq -\frac{2}{5}, x \neq -\frac{3}{4}$ D) $\frac{4x}{5x+2}, x \neq -\frac{2}{5}$

Objective: (0.6) Simplify Rational Expressions

358) $\frac{x^2+12x+35}{x^2+13x+42}$

A) $\frac{12x+5}{13x+6}, x \neq -\frac{6}{13}$ B) $\frac{12x+35}{13x+42}, x \neq -\frac{42}{13}$

C) $\frac{x+5}{x+6}, x \neq -6, -7$ D) $-\frac{x^2+12x+35}{x^2+13x+42}, x \neq -6, -7$

Objective: (0.6) Simplify Rational Expressions

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359) $\frac{7x^2 - 31x + 12}{x - 4}$

A) $\frac{1}{x - 4}$, $x \neq 4$

B) $\frac{7x^2 - 31x + 12}{x - 4}$, $x \neq 4$

C) $7x - 3$, $x \neq 4$

D) $7x^2 - 34$, no restrictions on x

Objective: (0.6) Simplify Rational Expressions

Provide an appropriate response.

360) The rational expression $\frac{120x}{100-x}$ describes the cost, in millions of dollars, to inoculate x percent of the current population of cattle against a particular virus. Choose which of the following statements are true with regard to this mathematical model.

I. The expression will be undefined when $x = 100$.
II. The cost of inoculating 90 percent of cattle is 900 million dollars more than the cost of inoculating 60 percent of cattle.
III. This expression will calculate inoculation costs for any population of cattle, no matter what the size.

A) All three statements are true.
B) Only I and III are true.
C) Only II and III are true.
D) Only I and II are true.

Objective: (0.6) Simplify Rational Expressions

Multiply or divide as indicated.

361) $\frac{3x}{6x + 3} \cdot \frac{4x + 2}{3}$

A) $\frac{2}{3}$
B) $\frac{2x}{9}$
C) $\frac{2x}{3}$
D) $\frac{x}{3}$

Objective: (0.6) Multiply Rational Expressions

362) $\frac{5x - 5}{x} \cdot \frac{6x^2}{7x - 7}$

A) $\frac{7}{30x}$
B) $\frac{30x^3 - 30x^2}{7x^2 - 7x}$
C) $\frac{35x^2 + 70x + 35}{6x^3}$
D) $\frac{30x}{7}$

Objective: (0.6) Multiply Rational Expressions

363) $\frac{6x - 2}{2x + 14} \cdot \frac{x + 7}{12x - 4}$

A) $\frac{1}{2}$
B) $\frac{x + 7}{4(x - 7)}$
C) $\frac{1}{4}$
D) 4

Objective: (0.6) Multiply Rational Expressions

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364) $\frac{x^3 + 1}{x^3 - x^2 + x} \cdot \frac{10x}{-120x - 120}$

A) $\frac{x + 1}{12(-x - 1)}$ B) $-\frac{x^2 + 1}{12}$ C) $-\frac{x^3 + 1}{12(x + 1)}$ D) $-\frac{1}{12}$

Objective: (0.6) Multiply Rational Expressions

365) $\frac{x^2 - 7x + 12}{x^2 + x - 12} \cdot \frac{x^2 - 9}{x^2 - x - 12}$

A) $\frac{x + 3}{x - 4}$ B) $\frac{x + 3}{x + 4}$ C) $\frac{x - 3}{x + 4}$ D) $\frac{x - 4}{x + 3}$

Objective: (0.6) Multiply Rational Expressions

366) $\frac{x^2 + 15x + 56}{x^2 + 16x + 64} \cdot \frac{x^2 + 8x}{x^2 + 3x - 28}$

A) $\frac{x}{x^2 + 16x + 64}$ B) $\frac{x(x + 8)}{x - 4}$ C) $\frac{x}{x - 4}$ D) $\frac{1}{x - 4}$

Objective: (0.6) Multiply Rational Expressions

367) $\frac{x^2 + 11x + 28}{x^2 + 13x + 42} \cdot \frac{x^2 + 6x}{x^2 + 7x + 12}$

A) $\frac{1}{x + 3}$ B) $\frac{x^2 + 6x}{x + 3}$ C) $\frac{x}{x + 3}$ D) $\frac{x}{x^2 + 13x + 42}$

Objective: (0.6) Multiply Rational Expressions

368) $\frac{x^2 + 5x + 6}{x^2 + 7x + 12} \cdot \frac{x^2 + 7x + 12}{x^2 + 5x + 6}$

A) $\frac{x + 4}{x + 3}$ B) $\frac{x + 2}{x + 4}$ C) $\frac{1}{x + 3}$ D) 1

Objective: (0.6) Multiply Rational Expressions

369) $\frac{x^2 - 14x + 40}{x^2 - 18x + 72} \cdot \frac{x^2 - 8x + 12}{x^2 - 11x + 28}$

A) $\frac{(x^2 - 14x + 40)(x^2 - 8x + 12)}{(x^2 - 18x + 72)(x^2 - 11x + 28)}$ B) $\frac{(x - 10)}{(x - 7)}$

C) $\frac{(x - 10)(x - 2)}{(x - 12)(x - 7)}$ D) $\frac{(x + 10)(x + 2)}{(x + 12)(x + 7)}$

Objective: (0.6) Multiply Rational Expressions

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370) $\frac{5x + 15}{8} \div \frac{4x + 12}{12}$

A) $\frac{15}{8}$ B) $\frac{5x + 15}{32x}$ C) $\frac{9x + 27}{20}$ D) $\frac{5}{24}$

Objective: (0.6) Divide Rational Expressions

371) $\frac{33x - 33}{9} \div \frac{11x - 11}{63}$

A) $\frac{7(33x - 33)}{11x - 11}$ B) $\frac{1}{21}$ C) $\frac{363(x - 1)^2}{567}$ D) 21

Objective: (0.6) Divide Rational Expressions

372) $\frac{(y - 9)^2}{4} \div \frac{4y - 36}{16}$

A) $\frac{(y - 9)^3}{16}$ B) $\frac{1}{y - 9}$ C) $\frac{4(y - 9)^2}{4y - 36}$ D) $y - 9$

Objective: (0.6) Divide Rational Expressions

373) $\frac{1}{x + 6} \div \frac{5}{x^2 - 36}$

A) $\frac{x - 6}{5}$ B) $\frac{5}{x - 6}$ C) $\frac{x + 6}{5}$ D) $x - 6$

Objective: (0.6) Divide Rational Expressions

374) $\frac{(x + 7)^2}{x - 7} \div \frac{x^2 - 49}{7x - 49}$

A) $\frac{(x + 7)^3}{7(x - 7)}$ B) $\frac{14(x^2 + 49)}{x^2 - 49}$ C) $\frac{7(x + 7)}{x - 7}$ D) $\frac{(x + 7)^2}{(x - 7)^2}$

Objective: (0.6) Divide Rational Expressions

375) $\frac{x^2 - 12x + 36}{7x - 42} \div \frac{12x - 72}{84}$

A) 84 B) $\frac{x^2 - 12x + 36}{(x - 6)^2}$ C) 1 D) $\frac{(x - 6)^2}{49}$

Objective: (0.6) Divide Rational Expressions

376) $\frac{x^2 + 10x + 21}{x^2 + 11x + 24} \div \frac{x^2 + 7x}{x^2 + 15x + 56}$

A) $\frac{x}{x^2 + 11x + 24}$ B) $\frac{x + 7}{x^2 + 8x}$ C) $\frac{x + 7}{x}$ D) $x + 7$

Objective: (0.6) Divide Rational Expressions

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377) $\frac{x^2 + 8x + 12}{x^2 + 11x + 18} \div \frac{x^2 + 6x}{x^2 + 2x - 63}$

A) $\frac{x - 7}{x^2 + 9x}$ B) $\frac{x - 7}{x}$ C) $\frac{x}{x^2 + 11x + 18}$ D) $x - 7$

Objective: (0.6) Divide Rational Expressions

378) $\frac{3x^2 + 14x - 49}{8x - 32} \cdot \frac{x^2 - 4x}{9x^2 - 49} \div \frac{7x + 49}{3x^3}$

A) $\frac{56}{3x^4(3x + 7)}$ B) $\frac{3x^3}{56(3x + 7)}$ C) $\frac{3x^4}{56(3x + 7)}$ D) $\frac{7(x + 7)^2}{24x^2(3x + 7)}$

Objective: (0.6) Divide Rational Expressions

Add or subtract as indicated.

379) $\frac{6x + 3}{7x + 8} + \frac{8x + 13}{7x + 8}$

A) $\frac{2}{7x + 8}$ B) 1 C) $\frac{8x + 9}{7x + 8}$ D) 2

Objective: (0.6) Add and Subtract Rational Expressions

380) $\frac{x^2 - 10x}{x^2 + 4x} + \frac{x^2 + x}{x^2 + 4x}$

A) $\frac{2x - 9}{x + 4}$ B) $\frac{-9}{x + 4}$ C) $\frac{x - 9}{x + 4}$ D) $\frac{2x + 9}{x + 4}$

Objective: (0.6) Add and Subtract Rational Expressions

381) $\frac{x^2 - 9x}{x - 4} + \frac{20}{x - 4}$

A) $x + 5$ B) $x - 4$ C) $\frac{x^2 - 9x + 20}{x - 4}$ D) $x - 5$

Objective: (0.6) Add and Subtract Rational Expressions

382) $\frac{9x + 4}{x^2 + 9x + 18} + \frac{2 - 8x}{x^2 + 9x + 18}$

A) $\frac{1}{x^2 + 9x + 18}$ B) $\frac{x - 6}{x^2 + 9x + 18}$ C) $\frac{1}{x + 3}$ D) $\frac{1}{x + 6}$

Objective: (0.6) Add and Subtract Rational Expressions

383) $\frac{x^2 - 12}{x^2 + 3x - 18} + \frac{3x - 6}{x^2 + 3x - 18}$

A) $\frac{x + 6}{x - 3}$ B) $\frac{(x - 6)(x + 3)}{(x + 6)(x - 3)}$ C) $\frac{x - 3}{x - 3}$ D) $\frac{x - 3}{x^2 + 3x - 18}$

Objective: (0.6) Add and Subtract Rational Expressions

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384) $\frac{6x}{x-8} - \frac{48}{x-8}$

A) $\frac{1}{6}$ B) $6x$ C) $\frac{6x-48}{x-16}$ D) 6

Objective: (0.6) Add and Subtract Rational Expressions

385) $\frac{x-8}{x-2} - \frac{2x+6}{x-2}$

A) $\frac{x+14}{x-2}$ B) $-\frac{x+14}{x-2}$ C) $\frac{x-14}{x-2}$ D) $-\frac{x-14}{x-2}$

Objective: (0.6) Add and Subtract Rational Expressions

386) $\frac{2x}{x^2-7x+10} - \frac{10}{x^2-7x+10}$

A) $\frac{2}{x-2}$ B) $\frac{2(x+5)}{(x-5)(x-2)}$ C) $\frac{2}{x-5}$ D) $\frac{2(x-5)}{(x+5)(x-2)}$

Objective: (0.6) Add and Subtract Rational Expressions

387) $\frac{8x-10}{x^2-11x+18} - \frac{7x-8}{x^2-11x+18}$

A) $\frac{x+2}{x^2-11x+18}$ B) $\frac{1}{x-2}$ C) $\frac{1}{x^2-11x+18}$ D) $\frac{1}{x-9}$

Objective: (0.6) Add and Subtract Rational Expressions

388) $\frac{3}{x} + \frac{7}{x-4}$

A) $\frac{10x-12}{x(4-x)}$ B) $\frac{12x-10}{x(x-4)}$ C) $\frac{12x-10}{x(4-x)}$ D) $\frac{10x-12}{x(x-4)}$

Objective: (0.6) Add and Subtract Rational Expressions

389) $\frac{5}{x+3} - \frac{2}{x-3}$

A) $\frac{3x-9}{(x+3)(x-3)}$ B) $\frac{3x-21}{(x+3)(x-3)}$ C) $\frac{3}{(x+3)(x-3)}$ D) $\frac{3x+21}{(x+3)(x-3)}$

Objective: (0.6) Add and Subtract Rational Expressions

390) $\frac{5}{x-8} + \frac{25}{8-x}$

A) $\frac{20}{x-8}$ B) $\frac{30}{x-8}$ C) $-\frac{20}{x-8}$ D) $-\frac{30}{x-8}$

Objective: (0.6) Add and Subtract Rational Expressions

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391) $\frac{11}{x-4} - \frac{3}{4-x}$

A) $\frac{14}{4-x}$ B) $\frac{56-14x}{(x-4)(4-x)}$ C) $\frac{14}{x-4}$ D) $\frac{8}{x-4}$

Objective: (0.6) Add and Subtract Rational Expressions

392) $\frac{4}{x^2-3x+2} + \frac{5}{x^2-1}$

A) $\frac{40x-6}{(x-1)(x+1)(x-2)}$ B) $\frac{6x-9}{(x-1)(x+1)(x-2)}$ C) $\frac{9x-6}{(x-1)(x-2)}$ D) $\frac{9x-6}{(x-1)(x+1)(x-2)}$

Objective: (0.6) Add and Subtract Rational Expressions

393) $\frac{x}{x^2-16} - \frac{5}{x^2+5x+4}$

A) $\frac{x^2-4}{(x-4)(x+4)(x+1)}$ B) $\frac{x^2-4x+20}{(x-4)(x+4)}$ C) $\frac{x^2-4x+20}{(x-4)(x+4)(x+1)}$ D) $\frac{x^2+4x+20}{(x-4)(x+4)(x+1)}$

Objective: (0.6) Add and Subtract Rational Expressions

394) $\frac{x+3}{x^2+3x-40} + \frac{3x+5}{x^2+6x-16}$

A) $4x+8$ B) $\frac{4x^2-9x-31}{(x-8)(x+5)(x+2)}$ C) $\frac{4x+8}{2x^2+9x-56}$ D) $\frac{4x^2-9x-31}{(x+8)(x-5)(x-2)}$

Objective: (0.6) Add and Subtract Rational Expressions

395) $\frac{6x}{x+1} + \frac{7}{x-1} - \frac{12}{x^2-1}$

A) $\frac{6x-5}{x-1}$ B) $\frac{6x-5}{x+1}$ C) $\frac{6x}{x-1}$ D) $\frac{x+1}{x-1}$

Objective: (0.6) Add and Subtract Rational Expressions

Solve the problem.

396) Doctors use the rational expression

$$\frac{DA}{A+12}$$

to determine the dosage of a drug prescribed for children. In this expression, A = child's age and D = adult dosage. What is the difference in the child's dosage for a 12–year–old child and an 8–year–old child? Express the answer as a single rational expression in terms of D.

A) $\frac{1}{10}D$ B) $\frac{1}{5}D$ C) $27D$ D) $\frac{1}{6}D$

Objective: (0.6) Add and Subtract Rational Expressions

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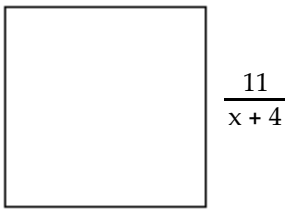
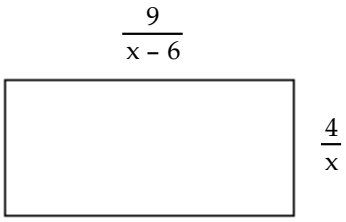
397) Express the perimeter of the square as a single rational expression.



A) $\frac{44}{x+16}$ B) $\frac{44}{x+4}$ C) $\frac{44}{x+8}$ D) $\frac{11}{x+16}$

Objective: (0.6) Add and Subtract Rational Expressions

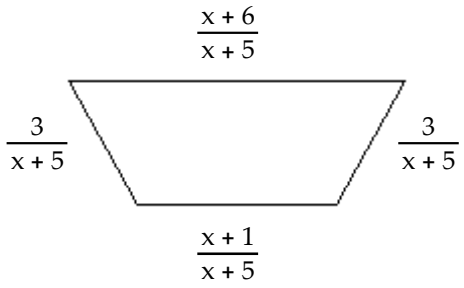
398) Express the perimeter of the rectangle as a single rational expression.



A) $\frac{13x-24}{x(6-x)}$ B) $\frac{26x-48}{x(6-x)}$ C) $\frac{26x-48}{x(x-6)}$ D) $\frac{13x-24}{x(x-6)}$

Objective: (0.6) Add and Subtract Rational Expressions

399) Express the perimeter of the trapezoid as a single rational expression.



A) $x+8$ B) $\frac{x+13}{x+5}$ C) $\frac{4x+13}{x+5}$ D) $\frac{2x+13}{x+5}$

Objective: (0.6) Add and Subtract Rational Expressions

Simplify the complex rational expression.

400) $\frac{\frac{x}{10}-1}{x-10}$

A) $x-10$ B) $\frac{10}{x-10}$ C) $\frac{1}{10}$ D) -10

Objective: (0.6) Simplify Complex Rational Expressions

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401) $\dfrac{1-\dfrac{2}{x}}{1+\dfrac{2}{x}}$

A) $x-2$ B) $\dfrac{x-2}{x+2}$ C) $x+2$ D) $\dfrac{x+2}{x-2}$

Objective: (0.6) Simplify Complex Rational Expressions

402) $\dfrac{\dfrac{7}{x}+1}{\dfrac{7}{x}-1}$

A) $\dfrac{x^2}{x^2+7}$ B) $\dfrac{7+x}{7-x}$ C) x^2+7 D) 7

Objective: (0.6) Simplify Complex Rational Expressions

403) $\dfrac{1-\dfrac{1}{x}}{2+\dfrac{1}{x}}$

A) $\dfrac{x-1}{2x+1}$ B) $\dfrac{2x+1}{x-1}$ C) $\dfrac{x+1}{2x-1}$ D) $\dfrac{x-1}{2x}$

Objective: (0.6) Simplify Complex Rational Expressions

404) $\dfrac{9+\dfrac{3}{x}}{\dfrac{x}{4}+\dfrac{1}{12}}$

A) $\dfrac{x}{36}$ B) $\dfrac{36}{x}$ C) 36 D) 1

Objective: (0.6) Simplify Complex Rational Expressions

405) $\dfrac{x-\dfrac{x}{x+6}}{x+5}$

A) $\dfrac{x}{x+6}$ B) $\dfrac{x^2}{x+6}$ C) $\dfrac{x}{x-6}$ D) $\dfrac{x}{x+5}$

Objective: (0.6) Simplify Complex Rational Expressions

406) $\dfrac{\dfrac{x}{x+4}+1}{\dfrac{12}{x^2-16}+1}$

A) $\dfrac{2x+8}{x+2}$ B) $\dfrac{x-4}{x-2}$ C) $\dfrac{2x-8}{x-2}$ D) $\dfrac{2x-8}{x+2}$

Objective: (0.6) Simplify Complex Rational Expressions

407) $\dfrac{\dfrac{10}{9x-1}-10}{\dfrac{10}{9x-1}+10}$

A) $\dfrac{2-9x}{9x}$ B) $\dfrac{9x}{2-9x}$ C) $\dfrac{2-x}{x}$ D) $\dfrac{2+9x}{9x}$

Objective: (0.6) Simplify Complex Rational Expressions

408) $\dfrac{\dfrac{1}{x+2}}{\dfrac{3}{x^2-4}}$

A) $\dfrac{x+2}{3}$ B) $x-2$ C) $\dfrac{3}{x-2}$ D) $\dfrac{x-2}{3}$

Objective: (0.6) Simplify Complex Rational Expressions

409) $\dfrac{\dfrac{36y^2-64x^2}{xy}}{\dfrac{6}{x}-\dfrac{8}{y}}$

A) $6x+8y$ B) $8x+6y$ C) $\dfrac{8x+6y}{xy}$ D) $\dfrac{xy}{6x+8y}$

Objective: (0.6) Simplify Complex Rational Expressions

410) $\dfrac{\dfrac{3}{x^2-3x-18}-\dfrac{1}{x-6}}{\dfrac{1}{x+3}+1}$

A) $\dfrac{x}{x^2-4x-24}$ B) $-\dfrac{x}{x^2-2x-24}$ C) $-\dfrac{x}{x^2-3x-18}$ D) -1

Objective: (0.6) Simplify Complex Rational Expressions

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Solve the problem.

411) The average speed on a round-trip commute having a one-way distance d is given by the complex rational expression

$$\frac{2d}{\frac{d}{r_1}+\frac{d}{r_2}},$$

in which r_1 and r_2 are the speeds on the outgoing and return trips, respectively. Fred and Michael both drove to campus averaging 40 miles per hour and each returned home on the same route he used going and averaged 45 miles per hour. Fred's one-way route was 6 miles longer than Michael's. Simplify the complex rational expression and answer the question: How does Fred's overall average speed compare with Michael's?

A) Fred's average speed is lower than Michael's.
B) Not enough information is given to answer the question.
C) Fred's average speed is the same as Michael's.
D) Fred's average speed is higher than Michael's.

Objective: (0.6) Simplify Complex Rational Expressions

Simplify the expression.

412) $\dfrac{\sqrt{x}-\dfrac{1}{3\sqrt{x}}}{\sqrt{x}}$

A) $1-\dfrac{1}{3x}$ B) $x^2-\dfrac{1}{3x}$ C) $1-\dfrac{1}{3}$ D) $\dfrac{\sqrt{x}-\dfrac{1}{3\sqrt{x}}}{\sqrt{x}}$

Objective: (0.6) Simplify Fractional Expressions That Occur in Calculus

413) $\dfrac{\dfrac{x^2}{\sqrt{x^2+7}}-\sqrt{x^2+7}}{x^2}$

A) $\dfrac{2x^2+7}{x^2\sqrt{x^2+7}}$ B) $\dfrac{\dfrac{x^2}{\sqrt{x^2+7}}-\sqrt{x^2+7}}{x^2}$ C) $\dfrac{7}{x^2\sqrt{x^2+7}}$ D) $\dfrac{-7}{x^2\sqrt{x^2+7}}$

Objective: (0.6) Simplify Fractional Expressions That Occur in Calculus

414) $\dfrac{\sqrt{4-x^2}+\dfrac{x^2}{\sqrt{4-x^2}}}{4-x^2}$

A) $\dfrac{4+2x^2}{(4-x^2)^{3/2}}$ B) $\dfrac{\sqrt{4-x^2}+\dfrac{x^2}{\sqrt{4-x^2}}}{4-x^2}$ C) $\dfrac{1+x^2}{(4-x^2)^{3/2}}$ D) $\dfrac{4}{(4-x^2)^{3/2}}$

Objective: (0.6) Simplify Fractional Expressions That Occur in Calculus

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415) $\dfrac{\dfrac{1}{\sqrt{x+3}} - \dfrac{1}{\sqrt{x}}}{3}$

A) $\dfrac{\dfrac{1}{\sqrt{x+3}} - \dfrac{1}{\sqrt{x}}}{3}$ B) $\dfrac{\sqrt{3}}{3\sqrt{x}\sqrt{x+3}}$ C) $\dfrac{1}{3}$ D) $\dfrac{1}{3\sqrt{x+3}} - \dfrac{1}{3\sqrt{x}}$

Objective: (0.6) Simplify Fractional Expressions That Occur in Calculus

Rationalize the numerator.

416) $\dfrac{\sqrt{x+8} - \sqrt{x}}{8}$

A) $\dfrac{\sqrt{x+8} - \sqrt{x}}{8}$ B) $\dfrac{1}{\sqrt{x+8} + \sqrt{x}}$ C) $\dfrac{\sqrt{x+8} + \sqrt{x}}{8}$ D) $\dfrac{2\sqrt{x+8}}{8\sqrt{x+8} + \sqrt{x}}$

Objective: (0.6) Rationalize Numerators

417) $\dfrac{\sqrt{x} - \sqrt{y}}{x^2 - y^2}$

A) $\dfrac{1}{(x+y)(\sqrt{x} + \sqrt{y})}$ B) $\dfrac{x^2 - y^2}{x^2 + y^2}$ C) $\dfrac{1}{(x+y)(\sqrt{x} - \sqrt{y})}$ D) $\dfrac{1}{x+y}$

Objective: (0.6) Rationalize Numerators

Solve the linear equation.

418) $8x - 6 = 74$

A) {76} B) {72} C) {15} D) {10}

Objective: (0.7) Solve Linear Equations in One Variable

419) $8x - (6x - 1) = 2$

A) $\left\{-\dfrac{1}{2}\right\}$ B) $\left\{-\dfrac{1}{14}\right\}$ C) $\left\{\dfrac{1}{2}\right\}$ D) $\left\{\dfrac{1}{14}\right\}$

Objective: (0.7) Solve Linear Equations in One Variable

420) $10a + 2 = 9a + 8$

A) {10} B) {–10} C) {6} D) {–6}

Objective: (0.7) Solve Linear Equations in One Variable

421) $27t - 3 = 7t + 13$

A) {17} B) $\left\{-\dfrac{4}{5}\right\}$ C) $\left\{\dfrac{4}{5}\right\}$ D) $\left\{\dfrac{27}{10}\right\}$

Objective: (0.7) Solve Linear Equations in One Variable

422) $7x - 8 = 5 - 4x$

A) $\left\{\dfrac{11}{13}\right\}$ B) {– 1} C) $\left\{-\dfrac{11}{13}\right\}$ D) $\left\{\dfrac{13}{11}\right\}$

Objective: (0.7) Solve Linear Equations in One Variable

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423) $2x - 7 = 3(x + 2)$

A) {1} B) {13} C) {−1} D) {−13}

Objective: (0.7) Solve Linear Equations in One Variable

424) $5(x + 4) + 7 = 4(x + 5) + 6$

A) {9} B) {17} C) {−1} D) {13}

Objective: (0.7) Solve Linear Equations in One Variable

425) $-18 - (3y + 2) = 2(y + 2) + 3y$

A) {−3} B) $\left\{-\frac{9}{4}\right\}$ C) $\left\{-\frac{1}{3}\right\}$ D) $\{-12\}$

Objective: (0.7) Solve Linear Equations in One Variable

426) $8y + 4(1 + y) = 3(y - 8) + 10y$

A) {9} B) {28} C) {−9} D) {−28}

Objective: (0.7) Solve Linear Equations in One Variable

427) $(-3x - 9) - 2 = -2(x + 6)$

A) {− 1} B) {− 5} C) {17} D) {1}

Objective: (0.7) Solve Linear Equations in One Variable

428) $6x - 6 + 7(x + 1) = 6x - 5$

A) $\{-1\}$ B) $\left\{-\frac{18}{7}\right\}$ C) $\left\{-\frac{6}{7}\right\}$ D) $\{-3\}$

Objective: (0.7) Solve Linear Equations in One Variable

429) $-6[6x + 5 + 4(x + 1)] = -5x - 1$

A) $\left\{-\frac{53}{55}\right\}$ B) $\left\{-\frac{7}{6}\right\}$ C) $\left\{\frac{53}{6}\right\}$ D) $\left\{\frac{7}{55}\right\}$

Objective: (0.7) Solve Linear Equations in One Variable

430) $\frac{x}{6} = \frac{x}{9} + 8$

A) {48} B) $\{144\}$ C) {54} D) {72}

Objective: (0.7) Solve Linear Equations Containing Fractions

431) $\frac{x}{3} = \frac{x}{2} + \frac{7}{3}$

A) $\left\{-\frac{1}{14}\right\}$ B) $\{-14\}$ C) 0 D) $\left\{-\frac{7}{3}\right\}$

Objective: (0.7) Solve Linear Equations Containing Fractions

432) $\frac{x}{18} + \frac{2}{9} = \frac{x + 4}{9}$

A) {0} B) {−6} C) {−4} D) {−2}

Objective: (0.7) Solve Linear Equations Containing Fractions

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433) $\frac{x+3}{6} - 1 = \frac{x-3}{5}$

A) $\{-33\}$ B) $\{3\}$ C) $\{32\}$ D) $\left\{\frac{3}{11}\right\}$

Objective: (0.7) Solve Linear Equations Containing Fractions

434) $55 - \frac{x}{4} = \frac{x}{7}$

A) {140} B) $\left\{\frac{605}{28}\right\}$ C) $\left\{\frac{605}{2}\right\}$ D) {5}

Objective: (0.7) Solve Linear Equations Containing Fractions

435) $\frac{2x}{5} = \frac{x}{3} + 3$

A) {−45} B) {45} C) {90} D) {−90}

Objective: (0.7) Solve Linear Equations Containing Fractions

436) $\frac{8x}{9} - x = \frac{x}{63} - \frac{4}{7}$

A) $\left\{-\frac{9}{2}\right\}$ B) $\left\{\frac{9}{2}\right\}$ C) $\{6\}$ D) $\{-6\}$

Objective: (0.7) Solve Linear Equations Containing Fractions

437) $\frac{x+8}{3} = \frac{14}{5} - \frac{x-2}{5}$

A) {42} B) {0} C) $\{18\}$ D) {1}

Objective: (0.7) Solve Linear Equations Containing Fractions

438) $\frac{x+16}{8} + \frac{x+8}{8} = x + 8$

A) $\left\{-\frac{28}{3}\right\}$ B) $\left\{-\frac{20}{3}\right\}$ C) $\{-12\}$ D) $\left\{-\frac{44}{3}\right\}$

Objective: (0.7) Solve Linear Equations Containing Fractions

First, write the value or values of the variable that make a denominator zero. Then solve the equation.

439) $\frac{6}{x} = \frac{1}{2x} + 55$

A) none; {5} B) 0, 2; $\left\{\frac{13}{22}\right\}$ C) 0; $\left\{\frac{1}{10}\right\}$ D) 0; {10}

Objective: (0.7) Solve Rational Equations with Variables in the Denominators

440) $\frac{2}{x} + 8 = \frac{5}{2x} + \frac{16}{3}$

A) 0, 2, 3; $\left\{\frac{3}{16}\right\}$ B) none; $\left\{\frac{16}{3}\right\}$ C) 0; $\left\{\frac{3}{16}\right\}$ D) 0; $\left\{\frac{16}{3}\right\}$

Objective: (0.7) Solve Rational Equations with Variables in the Denominators

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441) $\frac{x-9}{3x}+7=\frac{x+5}{x}$

A) 0; $\left\{-\frac{17}{2}\right\}$ B) 0, 3; $\left\{\frac{24}{19}\right\}$ C) none; $\left\{\frac{2}{3}\right\}$ D) 0; $\left\{\frac{24}{19}\right\}$

Objective: (0.7) Solve Rational Equations with Variables in the Denominators

442) $\frac{6}{x-3}+3=\frac{12}{x-3}$

A) 3; ∅ B) 3; {5} C) −3; {5} D) −3; {9}

Objective: (0.7) Solve Rational Equations with Variables in the Denominators

443) $\frac{20}{4x-4}+\frac{1}{4}=\frac{5}{x-1}$

A) 4; {1} B) 1; {1} C) −1, 4; {1, 4} D) 1; ∅

Objective: (0.7) Solve Rational Equations with Variables in the Denominators

444) $\frac{1}{x+2}+\frac{3}{x-2}=\frac{12}{(x+2)(x-2)}$

A) −2, 2; ∅ B) −2, 2; {3} C) none; {2} D) −2; {2}

Objective: (0.7) Solve Rational Equations with Variables in the Denominators

Solve the rational equation.

445) $\frac{x}{x-8}-6=\frac{8}{x-8}$

A) {−8} B) {−8, 8} C) {8} D) ∅

Objective: (0.7) Solve Rational Equations with Variables in the Denominators

446) $\frac{4}{x-1}+\frac{4}{2x-2}=6$

A) {24} B) {2} C) {1} D) {0}

Objective: (0.7) Solve Rational Equations with Variables in the Denominators

447) $\frac{2}{x-5}+\frac{8}{5-x}=\frac{8}{x+3}$

A) {5} B) $\left\{\frac{11}{9}\right\}$ C) $\left\{\frac{11}{7}\right\}$ D) $\left\{-\frac{11}{7}\right\}$

Objective: (0.7) Solve Rational Equations with Variables in the Denominators

448) $\frac{x}{2x+2}=\frac{2x-3}{x+1}-\frac{2x}{4x+4}$

A) {−3} B) $\left\{\frac{3}{2}\right\}$ C) $\left\{-\frac{12}{5}\right\}$ D) {3}

Objective: (0.7) Solve Rational Equations with Variables in the Denominators

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449) $\frac{9}{y+3} - \frac{7}{y-3} = \frac{8}{y^2-9}$

A) {28} B) {−28} C) {56} D) $\{\sqrt{64}\}$

Objective: (0.7) Solve Rational Equations with Variables in the Denominators

450) $\frac{1}{x+5} + \frac{3}{x+4} = \frac{-1}{x^2+9x+20}$

A) {0} B) {−5} C) {4} D) ∅

Objective: (0.7) Solve Rational Equations with Variables in the Denominators

451) $\frac{m+3}{m^2+9m+20} - \frac{3}{m^2+8m+16} = \frac{m-3}{m^2+9m+20}$

A) {−9} B) {−3} C) {18} D) {3}

Objective: (0.7) Solve Rational Equations with Variables in the Denominators

Solve the problem.

452) The formula $C = \frac{28{,}000 + 260x}{x}$ models the average cost per unit, C, for Electrostuff to manufacture x units of Electrogadget IV. How many units must the company produce to have an average cost per unit of $390?

A) 217 units B) 108 units C) 200 units D) 215 units

Objective: (0.7) Solve Rational Equations with Variables in the Denominators

453) Suppose a cost–benefit model is given by $y = \frac{2{,}571x}{100 - x}$, where y is the cost for removing x percent of a given pollutant. What percent of pollutant can be removed for $40,000?

A) 106.9% B) 608.7% C) 9.4% D) 94.0%

Objective: (0.7) Solve Rational Equations with Variables in the Denominators

454) The U.S. Maritime Administration estimated that the cost per ton of building an oil tanker could be represented by the model $y = \frac{105{,}000}{x + 215}$, where y is the cost in dollars per ton and x is the tons (in thousands). What size of oil tanker (in thousands of tons) can be built for $350 per ton?

A) 85 thousand tons B) 515 thousand tons C) 186 thousand tons D) 9 thousand tons

Objective: (0.7) Solve Rational Equations with Variables in the Denominators

Solve the formula for the specified variable.

455) $A = \frac{1}{2}bh$ for b

A) $b = \frac{2A}{h}$ B) $b = \frac{A}{2h}$ C) $b = \frac{h}{2A}$ D) $b = \frac{Ah}{2}$

Objective: (0.7) Solve a Formula for a Variable

456) $S = 2\pi rh + 2\pi r^2$ for h

A) $h = \frac{S - 2\pi r^2}{2\pi r}$ B) $h = \frac{S}{2\pi r} - 1$ C) $h = S - r$ D) $h = 2\pi(S - r)$

Objective: (0.7) Solve a Formula for a Variable

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457) $V = \frac{1}{3}Bh$ for h

A) $h = \frac{V}{3B}$ B) $h = \frac{3B}{V}$ C) $h = \frac{3V}{B}$ D) $h = \frac{B}{3V}$

Objective: (0.7) Solve a Formula for a Variable

458) $F = \frac{9}{5}C + 32$ for C

A) $C = \frac{5}{F - 32}$ B) $C = \frac{9}{5}(F - 32)$ C) $C = \frac{5}{9}(F - 32)$ D) $C = \frac{F - 32}{9}$

Objective: (0.7) Solve a Formula for a Variable

459) $A = \frac{1}{2}h(a + b)$ for a

A) $a = \frac{2A - hb}{h}$ B) $a = \frac{A - hb}{2h}$ C) $a = \frac{2Ab - h}{h}$ D) $a = \frac{hb - 2A}{h}$

Objective: (0.7) Solve a Formula for a Variable

460) $d = rt$ for t

A) $t = dr$ B) $t = d - r$ C) $t = \frac{d}{r}$ D) $t = \frac{r}{d}$

Objective: (0.7) Solve a Formula for a Variable

461) $P = 2L + 2W$ for W

A) $W = P - 2L$ B) $W = P - L$ C) $W = \frac{P - L}{2}$ D) $W = \frac{P - 2L}{2}$

Objective: (0.7) Solve a Formula for a Variable

462) $A = P(1 + nr)$ for n

A) $n = \frac{A - P}{Pr}$ B) $n = \frac{A}{r}$ C) $n = \frac{Pr}{A - P}$ D) $n = \frac{P - A}{Pr}$

Objective: (0.7) Solve a Formula for a Variable

463) $I = Prt$ for P

A) $P = r - It$ B) $P = \frac{r - 1}{It}$ C) $P = \frac{r - I}{1 + t}$ D) $P = \frac{I}{rt}$

Objective: (0.7) Solve a Formula for a Variable

464) $\frac{1}{a} + \frac{1}{b} = \frac{1}{c}$ for c

A) $c = \frac{a + b}{ab}$ B) $c = a + b$ C) $c = ab(a + b)$ D) $c = \frac{ab}{a + b}$

Objective: (0.7) Solve a Formula for a Variable

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465) $P = \dfrac{A}{1 + rt}$ for r

A) $r = \dfrac{P - A}{1 + t}$ B) $r = P - At$ C) $r = \dfrac{P - 1}{At}$ D) $r = \dfrac{A - P}{Pt}$

Objective: (0.7) Solve a Formula for a Variable

466) $A = \dfrac{1}{2}h(B + b)$ for B

A) $B = 2A - bh$ B) $B = \dfrac{2A + bh}{h}$ C) $B = \dfrac{A - bh}{h}$ D) $B = \dfrac{2A - bh}{h}$

Objective: (0.7) Solve a Formula for a Variable

467) $P = s_1 + s_2 + s_3$ for s_1

A) $s_1 = P - s_2 - s_3$ B) $s_1 = P + s_2 - s_3$ C) $s_1 = s_2 + s_3 - P$ D) $s_1 = P + s_2 + s_3$

Objective: (0.7) Solve a Formula for a Variable

468) $I = \dfrac{nE}{nr + R}$ for n

A) $n = \dfrac{-R}{Ir - E}$ B) $n = IR(Ir - E)$ C) $n = \dfrac{IR}{Ir + E}$ D) $n = \dfrac{IR}{E - Ir}$

Objective: (0.7) Solve a Formula for a Variable

Solve the absolute value equation or indicate that the equation has no solution.

469) $|x| = 8$

A) {–8, 8} B) {8} C) {64} D) {–8}

Objective: (0.7) Solve Equations Involving Absolute Value

470) $|x - 9| = 5$

A) {4, 14} B) ∅ C) {–4, 14} D) {–14}

Objective: (0.7) Solve Equations Involving Absolute Value

471) $|x - 2| = 9$

A) {–11, 7} B) ∅ C) {11} D) {–7, 11}

Objective: (0.7) Solve Equations Involving Absolute Value

472) $|7x + 3| = 6$

A) $\left\{\frac{3}{7}, -\frac{9}{7}\right\}$ B) $\left\{-\frac{3}{7}, \frac{9}{7}\right\}$ C) $\{1, -3\}$ D) ∅

Objective: (0.7) Solve Equations Involving Absolute Value

473) $3|x - 3| = 18$

A) {3, –9} B) {9, –3} C) ∅ D) {3}

Objective: (0.7) Solve Equations Involving Absolute Value

474) $|x + 2| + 6 = 11$

A) {3} B) {–7, 3} C) {–3, 7} D) ∅

Objective: (0.7) Solve Equations Involving Absolute Value

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475) $|5x + 9| + 7 = 15$

A) $\varnothing$ B) $\left\{-\frac{17}{5}, -\frac{1}{5}\right\}$ C) $\left\{-\frac{17}{9}, -\frac{1}{9}\right\}$ D) $\left\{\frac{1}{5}, \frac{17}{5}\right\}$

Objective: (0.7) Solve Equations Involving Absolute Value

476) $|4x - 7| - 5 = -10$

A) $\left\{\frac{1}{2}, -3\right\}$ B) $\varnothing$ C) $\left\{3, -\frac{1}{2}\right\}$ D) $\left\{\frac{1}{2}\right\}$

Objective: (0.7) Solve Equations Involving Absolute Value

477) $\left|3 - \frac{1}{5}x\right| = 5$

A) {−8, − 2} B) {− 2, 8} C) {− 40, − 10} D) {40, − 10}

Objective: (0.7) Solve Equations Involving Absolute Value

478) $\left|2 - \frac{4}{5}x\right| - 5 = 9$

A) {15, − 20} B) {− 15, 20} C) {− 15} D) $\left\{-\frac{48}{5}\right\}$

Objective: (0.7) Solve Equations Involving Absolute Value

Solve the equation by factoring.

479) $x^2 = x + 42$

A) {1, 42} B) {6, 7} C) {−6, −7} D) {−6, 7}

Objective: (0.7) Solve Quadratic Equations by Factoring

480) $x^2 + 10x - 24 = 0$

A) {−12, 2} B) {−12, 1} C) {12, 2} D) {12, −2}

Objective: (0.7) Solve Quadratic Equations by Factoring

481) $8x^2 + 26x + 15 = 0$

A) $\left\{-\frac{5}{2}, -\frac{3}{4}\right\}$ B) $\left\{\frac{5}{2}, -\frac{3}{4}\right\}$ C) $\left\{-\frac{5}{8}, -\frac{1}{5}\right\}$ D) $\left\{\frac{5}{2}, \frac{3}{4}\right\}$

Objective: (0.7) Solve Quadratic Equations by Factoring

482) $9x^2 - 71x = 8$

A) $\left\{-\frac{1}{9}, 9\right\}$ B) $\left\{-\frac{1}{9}, 8\right\}$ C) $\left\{\frac{1}{71}, -\frac{1}{9}\right\}$ D) {−9, 8}

Objective: (0.7) Solve Quadratic Equations by Factoring

483) $7x^2 - 3x = 0$

A) $\left\{0, \frac{3}{7}\right\}$ B) {0} C) $\left\{\frac{3}{7}, -\frac{3}{7}\right\}$ D) $\left\{-\frac{3}{7}, 0\right\}$

Objective: (0.7) Solve Quadratic Equations by Factoring

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484) $3x(x - 3) = 7x^2 - 10x$

A) $\left\{0, \frac{1}{4}\right\}$ B) {0, 4} C) {0} D) $\left\{-\frac{1}{4}, 0\right\}$

Objective: (0.7) Solve Quadratic Equations by Factoring

485) $7 - 7x = (4x + 9)(x - 1)$

A) {−4, 1} B) {1} C) $\left\{1, -\frac{9}{4}\right\}$ D) {−1, 4}

Objective: (0.7) Solve Quadratic Equations by Factoring

486) $-6x - 2 = (3x + 1)^2$

A) $\left\{-1, -\frac{1}{3}\right\}$ B) $\left\{-\frac{1}{3}\right\}$ C) ∅ D) $\left\{\frac{1}{3}, 1\right\}$

Objective: (0.7) Solve Quadratic Equations by Factoring

Solve the quadratic equation by the square root property.

487) $2x^2 = 32$

A) {−2, 2} B) {0} C) {−4, 4} D) $\{-4\sqrt{2}, 4\sqrt{2}\}$

Objective: (0.7) Solve Quadratic Equations by the Square Root Property

488) $4x^2 = 28$

A) {8} B) $\{-\sqrt{7}, \sqrt{7}\}$ C) {−7, 7} D) {14}

Objective: (0.7) Solve Quadratic Equations by the Square Root Property

489) $2x^2 + 4 = 342$

A) {171} B) {−13, 13} C) {13} D) {−14, 14}

Objective: (0.7) Solve Quadratic Equations by the Square Root Property

490) $(x - 6)^2 = 25$

A) {31} B) {1, 11} C) {−5, 5} D) {−11, 1}

Objective: (0.7) Solve Quadratic Equations by the Square Root Property

491) $(2x - 1)^2 = 9$

A) {−2, 1} B) {−2, 4} C) {−4, 2} D) {−1, 2}

Objective: (0.7) Solve Quadratic Equations by the Square Root Property

492) $(2x + 3)^2 = 25$

A) {−4, 1} B) {0, 1} C) {−14, 14} D) {1, 4}

Objective: (0.7) Solve Quadratic Equations by the Square Root Property

493) $3(x - 8)^2 = 15$

A) {3, 13} B) $\{8 - \sqrt{5}, 8 + \sqrt{5}\}$ C) {−13, −3} D) $\{-8 - \sqrt{5}, -8 + \sqrt{5}\}$

Objective: (0.7) Solve Quadratic Equations by the Square Root Property

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494) $(2x + 3)^2 = 7$

A) $\left\{\frac{\sqrt{7} - 3}{2}, \frac{\sqrt{7} + 3}{2}\right\}$

B) $\{-5, 2\}$

C) $\left\{\frac{3 - \sqrt{7}}{2}, \frac{3 + \sqrt{7}}{2}\right\}$

D) $\left\{\frac{-3 - \sqrt{7}}{2}, \frac{-3 + \sqrt{7}}{2}\right\}$

Objective: (0.7) Solve Quadratic Equations by the Square Root Property

495) $(11x - 3)^2 = 12$

A) $\left\{\frac{-3 - 2\sqrt{3}}{11}, \frac{-3 + 2\sqrt{3}}{11}\right\}$

B) $\left\{\frac{3 - 2\sqrt{3}}{11}, \frac{3 + 2\sqrt{3}}{11}\right\}$

C) $\left\{-\frac{9}{11}, \frac{15}{11}\right\}$

D) $\{-2\sqrt{11}, 2\sqrt{11}\}$

Objective: (0.7) Solve Quadratic Equations by the Square Root Property

Solve the quadratic equation by completing the square.

496) $x^2 - 8x - 33 = 0$

A) $\{-3, 11\}$ B) $\{-11, 3\}$ C) $\{-3, -30\}$ D) $\{-\sqrt{33}, \sqrt{33}\}$

Objective: (0.7) Solve Quadratic Equations by Completing the Square

497) $x^2 + 14x = -38$

A) $\{-7 - \sqrt{11}, -7 + \sqrt{11}\}$

B) $\{-14 + \sqrt{38}\}$

C) $\{7 - \sqrt{38}, 7 + \sqrt{38}\}$

D) $\{7 + \sqrt{11}\}$

Objective: (0.7) Solve Quadratic Equations by Completing the Square

498) $x^2 + 14x + 30 = 0$

A) $\{-14 + \sqrt{30}\}$

B) $\{7 + \sqrt{19}\}$

C) $\{-7 - \sqrt{19}, -7 + \sqrt{19}\}$

D) $\{7 - \sqrt{30}, 7 + \sqrt{30}\}$

Objective: (0.7) Solve Quadratic Equations by Completing the Square

499) $x^2 + 8x - 3 = 0$

A) $\{-1 - \sqrt{19}, -1 + \sqrt{19}\}$

B) $\{4 + \sqrt{19}\}$

C) $\{-4 - \sqrt{19}, -4 + \sqrt{19}\}$

D) $\{-4 - 1\sqrt{19}, -4 + 1\sqrt{19}\}$

Objective: (0.7) Solve Quadratic Equations by Completing the Square

500) $x^2 - 12x - 5 = 0$

A) $\{-6 - \sqrt{41}, -6 + \sqrt{41}\}$

B) $\{6 - \sqrt{41}, 6 + \sqrt{41}\}$

C) $\{12 - \sqrt{149}, 12 + \sqrt{149}\}$

D) $\{6 - \sqrt{5}, 6 + \sqrt{5}\}$

Objective: (0.7) Solve Quadratic Equations by Completing the Square

501) $z^2 + 16z + 44 = 0$

A) $\{8 + 2\sqrt{5}\}$

B) $\{8 + 2\sqrt{11}, 8 - 2\sqrt{11}\}$

C) $\{-16 + 2\sqrt{11}\}$

D) $\{-8 + 2\sqrt{5}, -8 - 2\sqrt{5}\}$

Objective: (0.7) Solve Quadratic Equations by Completing the Square

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502) $x^2 + 4x = 16$

A) $\{-2 - 2\sqrt{10}, -2 + 2\sqrt{10}\}$ B) $\{2\sqrt{5} - 2, 2\sqrt{5} + 2\}$

C) $\{-2\sqrt{5}, 2\sqrt{5}\}$ D) $\{-2 - 2\sqrt{5}, -2 + 2\sqrt{5}\}$

Objective: (0.7) Solve Quadratic Equations by Completing the Square

503) $x^2 + 3x - 9 = 0$

A) $\left\{\frac{3 + 3\sqrt{5}}{2}\right\}$ B) $\{-3 - 3\sqrt{5}, -3 + 3\sqrt{5}\}$

C) $\left\{\frac{-3 - 3\sqrt{5}}{2}\right\}$ D) $\left\{\frac{-3 - 3\sqrt{5}}{2}, \frac{-3 + 3\sqrt{5}}{2}\right\}$

Objective: (0.7) Solve Quadratic Equations by Completing the Square

504) $7x^2 - 2x - 3 = 0$

A) $\left\{-3, \frac{23}{7}\right\}$ B) $\left\{\frac{-1 - \sqrt{22}}{7}, \frac{-1 + \sqrt{22}}{7}\right\}$

C) $\left\{\frac{7 - \sqrt{22}}{49}, \frac{7 + \sqrt{22}}{49}\right\}$ D) $\left\{\frac{1 - \sqrt{22}}{7}, \frac{1 + \sqrt{22}}{7}\right\}$

Objective: (0.7) Solve Quadratic Equations by Completing the Square

Solve the quadratic equation using the quadratic formula.

505) $x^2 + 2x - 63 = 0$

A) $\{-9, 7\}$ B) $\{-7, 9\}$ C) $\{9, 7\}$ D) $\{-9, 1\}$

Objective: (0.7) Solve Quadratic Equations Using the Quadratic Formula

506) $x^2 + 10x + 14 = 0$

A) $\{-5 - \sqrt{11}, -5 + \sqrt{11}\}$ B) $\{5 - \sqrt{14}, 5 + \sqrt{14}\}$

C) $\{-10 + \sqrt{14}\}$ D) $\{5 + \sqrt{11}\}$

Objective: (0.7) Solve Quadratic Equations Using the Quadratic Formula

507) $x^2 + 4x = 3$

A) $\{-1 - \sqrt{7}, -1 + \sqrt{7}\}$ B) $\{2 + \sqrt{7}\}$

C) $\{-2 - 2\sqrt{7}, -2 + 2\sqrt{7}\}$ D) $\{-2 - \sqrt{7}, -2 + \sqrt{7}\}$

Objective: (0.7) Solve Quadratic Equations Using the Quadratic Formula

508) $x^2 + 5x + 1 = 0$

A) $\left\{\frac{-5 - \sqrt{21}}{10}, \frac{-5 + \sqrt{21}}{10}\right\}$ B) $\left\{\frac{-5 - \sqrt{29}}{2}, \frac{-5 + \sqrt{29}}{2}\right\}$

C) $\left\{\frac{5 - \sqrt{21}}{2}, \frac{5 + \sqrt{21}}{2}\right\}$ D) $\left\{\frac{-5 - \sqrt{21}}{2}, \frac{-5 + \sqrt{21}}{2}\right\}$

Objective: (0.7) Solve Quadratic Equations Using the Quadratic Formula

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509) $2x^2 + 10x + 7 = 0$

A) $\left\{\frac{-5-\sqrt{11}}{2}, \frac{-5+\sqrt{11}}{2}\right\}$

B) $\left\{\frac{-10-\sqrt{11}}{2}, \frac{-10+\sqrt{11}}{2}\right\}$

C) $\left\{\frac{-5-\sqrt{11}}{4}, \frac{-5+\sqrt{11}}{4}\right\}$

D) $\left\{\frac{-5-\sqrt{39}}{2}, \frac{-5+\sqrt{39}}{2}\right\}$

Objective: (0.7) Solve Quadratic Equations Using the Quadratic Formula

510) $2x^2 + x - 5 = 0$

A) $\left\{\frac{-1-\sqrt{41}}{2}, \frac{-1+\sqrt{41}}{2}\right\}$

B) $\left\{\frac{-1-\sqrt{41}}{4}, \frac{-1+\sqrt{41}}{4}\right\}$

C) $\left\{\frac{1-\sqrt{41}}{4}, \frac{1+\sqrt{41}}{4}\right\}$

D) $\emptyset$

Objective: (0.7) Solve Quadratic Equations Using the Quadratic Formula

511) $7x^2 = -10x - 2$

A) $\left\{\frac{-5-\sqrt{11}}{14}, \frac{-5+\sqrt{11}}{14}\right\}$

B) $\left\{\frac{-5-\sqrt{39}}{7}, \frac{-5+\sqrt{39}}{7}\right\}$

C) $\left\{\frac{-5-\sqrt{11}}{7}, \frac{-5+\sqrt{11}}{7}\right\}$

D) $\left\{\frac{-10-\sqrt{11}}{7}, \frac{-10+\sqrt{11}}{7}\right\}$

Objective: (0.7) Solve Quadratic Equations Using the Quadratic Formula

Compute the discriminant. Then determine the number and type of solutions for the given equation.

512) $x^2 + 3x + 2 = 0$

A) −17; no real solution

B) 0; one real solution

C) 1; one real solution

D) 1; two unequal real solutions

Objective: (0.7) Use the Discriminant to Determine the Number and Type of Solutions of Quadratic Equations

513) $x^2 - 10x + 25 = 0$

A) −100; two unequal real solutions

B) −100; no real solution

C) 100; two unequal real solutions

D) 0; one real solution

Objective: (0.7) Use the Discriminant to Determine the Number and Type of Solutions of Quadratic Equations

514) $7x^2 = -2x - 1$

A) −32; no real solution

B) 0; one real solution

C) 32; two unequal real solutions

D) −24; no real solution

Objective: (0.7) Use the Discriminant to Determine the Number and Type of Solutions of Quadratic Equations

Solve the quadratic equation by the method of your choice.

515) $(4x + 7)^2 = 4$

A) $\left\{\frac{5}{4}, \frac{9}{4}\right\}$

B) $\left\{-\frac{9}{4}, -\frac{5}{4}\right\}$

C) $\left\{-\frac{5}{4}, 0\right\}$

D) $\left\{\frac{3}{4}\right\}$

Objective: (0.7) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

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516) $9x^2 - 35x - 4 = 0$

A) $\left\{-\frac{1}{9}, \frac{1}{35}\right\}$ B) $\left\{-\frac{1}{9}, 9\right\}$ C) $\{-9, 4\}$ D) $\left\{-\frac{1}{9}, 4\right\}$

Objective: (0.7) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

517) $2x^2 = 7x + 9$

A) $\left\{\frac{2}{9}, 0\right\}$ B) $\left\{\frac{2}{9}, 1\right\}$ C) $\left\{\frac{9}{2}, -1\right\}$ D) $\left\{\frac{2}{9}, -1\right\}$

Objective: (0.7) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

518) $3x^2 - 9 = 26x$

A) $\left\{-\frac{1}{3}, 9\right\}$ B) $\left\{-\frac{1}{3}, 3\right\}$ C) $\{-3, 9\}$ D) $\left\{\frac{1}{26}, -\frac{1}{3}\right\}$

Objective: (0.7) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

519) $3x^2 - 108 = 0$

A) $\{-6, 6\}$ B) $\{0\}$ C) $\{-3, 3\}$ D) $\{-6\sqrt{3}, 6\sqrt{3}\}$

Objective: (0.7) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

520) $x^2 + 6x = -9$

A) $\{3\}$ B) $\{-3\}$ C) $\{-3, 3]$ D) $\{-\sqrt{3}\}$

Objective: (0.7) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

521) $x^2 + 4x = 3$

A) $\{-2 - \sqrt{7}, -2 + \sqrt{7}\}$ B) $\{-1 - \sqrt{7}, -1 + \sqrt{7}\}$

C) $\{-2 - 2\sqrt{7}, -2 + 2\sqrt{7}\}$ D) $\{2 + \sqrt{7}\}$

Objective: (0.7) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

522) $3x^2 + 8x = -2$

A) $\left\{\frac{-4 - \sqrt{10}}{3}, \frac{-4 + \sqrt{10}}{3}\right\}$ B) $\left\{\frac{-8 - \sqrt{10}}{3}, \frac{-8 + \sqrt{10}}{3}\right\}$

C) $\left\{\frac{-4 - \sqrt{22}}{3}, \frac{-4 + \sqrt{22}}{3}\right\}$ D) $\left\{\frac{-4 - \sqrt{10}}{6}, \frac{-4 + \sqrt{10}}{6}\right\}$

Objective: (0.7) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

523) $2x^2 = -10x - 5$

A) $\left\{\frac{-5 - \sqrt{15}}{2}, \frac{-5 + \sqrt{15}}{2}\right\}$ B) $\left\{\frac{-10 - \sqrt{15}}{2}, \frac{-10 + \sqrt{15}}{2}\right\}$

C) $\left\{\frac{-5 - \sqrt{15}}{4}, \frac{-5 + \sqrt{15}}{4}\right\}$ D) $\left\{\frac{-5 - \sqrt{35}}{2}, \frac{-5 + \sqrt{35}}{2}\right\}$

Objective: (0.7) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

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524) $4x^2 + 12x + 6 = 0$

A) $\left\{\frac{-3-\sqrt{3}}{8}, \frac{-3+\sqrt{3}}{8}\right\}$

B) $\left\{\frac{-3-\sqrt{3}}{2}, \frac{-3+\sqrt{3}}{2}\right\}$

C) $\left\{\frac{-12-\sqrt{3}}{2}, \frac{-12+\sqrt{3}}{2}\right\}$

D) $\left\{\frac{-3-\sqrt{15}}{2}, \frac{-3+\sqrt{15}}{2}\right\}$

Objective: (0.7) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

525) $5x^2 = 65$

A) $\{-\sqrt{13}, \sqrt{13}\}$ B) $\{32.5\}$ C) $\{-13, 13\}$ D) $\{14\}$

Objective: (0.7) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

526) $11x^2 - 55 = 0$

A) $\left\{-\frac{\sqrt{55}}{11}, \frac{\sqrt{55}}{11}\right\}$ B) $\{-\sqrt{55}, \sqrt{55}\}$ C) $\{-\sqrt{5}, \sqrt{5}\}$ D) $\{\sqrt{5}\}$

Objective: (0.7) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

527) $x^2 + 10x + 15 = 0$

A) $\{-10 + \sqrt{15}\}$

B) $\{5 - \sqrt{15}, 5 + \sqrt{15}\}$

C) $\{-5 - \sqrt{10}, -5 + \sqrt{10}\}$

D) $\{5 + \sqrt{10}\}$

Objective: (0.7) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

528) $(5x + 3)^2 = 5$

A) $\left\{-\frac{8}{5}, \frac{2}{5}\right\}$

B) $\left\{\frac{3-\sqrt{5}}{5}, \frac{3+\sqrt{5}}{5}\right\}$

C) $\left\{\frac{-3-\sqrt{5}}{5}, \frac{-3+\sqrt{5}}{5}\right\}$

D) $\left\{\frac{\sqrt{5}-3}{5}, \frac{\sqrt{5}+3}{5}\right\}$

Objective: (0.7) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

529) $(x + 4)(x - 9) = 7$

A) $\left\{\frac{-5-\sqrt{197}}{2}, \frac{-5+\sqrt{197}}{2}\right\}$

B) $\left\{\frac{5-i\sqrt{197}}{2}, \frac{5+i\sqrt{197}}{2}\right\}$

C) $\left\{\frac{-5-i\sqrt{197}}{2}, \frac{-5+i\sqrt{197}}{2}\right\}$

D) $\left\{\frac{5-\sqrt{197}}{2}, \frac{5+\sqrt{197}}{2}\right\}$

Objective: (0.7) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

530) $\frac{x^2}{18} + x + \frac{59}{18} = 0$

A) $\{-9 - \sqrt{22}, -9 + \sqrt{22}\}$

B) $\{-18 + \sqrt{59}\}$

C) $\{9 + \sqrt{22}\}$

D) $\{9 - \sqrt{59}, 9 + \sqrt{59}\}$

Objective: (0.7) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

Test Bank for Precalculus 7th Blitzer

531) $\frac{1}{x+7}+\frac{1}{x}=\frac{1}{5}$

A) $\left\{\frac{-17-\sqrt{149}}{2}, \frac{-17+\sqrt{149}}{2}\right\}$

B) $\left\{\frac{17-\sqrt{149}}{2}, \frac{17+\sqrt{149}}{2}\right\}$

C) $\left\{\frac{3-\sqrt{149}}{2}, \frac{3+\sqrt{149}}{2}\right\}$

D) $\left\{\frac{-3-\sqrt{149}}{2}, \frac{-3+\sqrt{149}}{2}\right\}$

Objective: (0.7) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

532) $\frac{9}{x-7}+\frac{x}{x+7}=\frac{67}{x^2-49}$

A) $\{-1-\sqrt{5}, -1+\sqrt{5}\}$

B) $\{-1-\sqrt{23}, -1+\sqrt{23}\}$

C) $\{1-\sqrt{5}, 1+\sqrt{5}\}$

D) $\{1-\sqrt{23}, 1+\sqrt{23}\}$

Objective: (0.7) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

533) $\frac{y}{y+4}+\frac{8y+28}{y^2+7y+12}=\frac{4}{y+3}$

A) $\{-3, -4\}$ B) $\varnothing$ C) $\{-6, 5\}$ D) $\{4, 3\}$

Objective: (0.7) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

534) $5x^2-\sqrt{3}x-1=0$

A) $\left\{\frac{\sqrt{3}-\sqrt{29}}{10}, \frac{\sqrt{3}+\sqrt{29}}{10}\right\}$

B) $\left\{\frac{\sqrt{3}-i\sqrt{17}}{10}, \frac{\sqrt{3}+i\sqrt{17}}{10}\right\}$

C) $\left\{\frac{\sqrt{3}-\sqrt{23}}{10}, \frac{\sqrt{3}+\sqrt{23}}{10}\right\}$

D) $\left\{\frac{-\sqrt{3}-\sqrt{23}}{10}, \frac{-\sqrt{3}+\sqrt{23}}{10}\right\}$

Objective: (0.7) Determine the Most Efficient Method to Use When Solving a Quadratic Equation

Solve the radical equation, and check all proposed solutions.

535) $\sqrt{x+2}=2$

A) $\{2\}$ B) $\{4\}$ C) $\{16\}$ D) $\{6\}$

Objective: (0.7) Solve Radical Equations

536) $\sqrt{3x-2}=2$

A) $\varnothing$ B) $\left\{\frac{2}{3}\right\}$ C) $\{4\}$ D) $\{2\}$

Objective: (0.7) Solve Radical Equations

537) $\sqrt{x-3}=x-5$

A) $\{7\}$ B) $\{4\}$ C) $\{4, 7\}$ D) $\{-7\}$

Objective: (0.7) Solve Radical Equations

538) $\sqrt{6x+27}=x$

A) $\varnothing$ B) $\left\{-\frac{27}{5}\right\}$ C) $\{9\}$ D) $\{-3, 9\}$

Objective: (0.7) Solve Radical Equations

Test Bank for Precalculus 7th Blitzer

539) $\sqrt{12x - 12} = x + 2$

A) {4} B) {−4} C) {−3} D) {6}

Objective: (0.7) Solve Radical Equations

540) $x - 7 = \sqrt{3x + 7}$

A) ∅ B) {7} C) {14} D) {3, 14}

Objective: (0.7) Solve Radical Equations

541) $\sqrt{14x - 7} - 3 = x$

A) {−4} B) {3} C) {4} D) {−3}

Objective: (0.7) Solve Radical Equations

542) $x - \sqrt{3x - 2} = 4$

A) {2, 9} B) {9} C) {1, 2} D) {−1}

Objective: (0.7) Solve Radical Equations

543) $\sqrt{2x} + 11 = x + 7$

A) $\left\{-4, \frac{4}{3}\right\}$ B) {−4} C) {2, 8} D) {8}

Objective: (0.7) Solve Radical Equations

Solve the problem.

544) For a culture of 60,000 bacteria of a certain strain, the number of bacteria N that will survive x hours is modeled by the formula $N = 6{,}000\sqrt{100 - x}$. After how many hours will 42,000 bacteria survive?

A) 51 hr B) 49 hr C) 93 hr D) 58 hr

Objective: (0.7) Solve Radical Equations

545) The formula $L = 6.75\sqrt{x} + 12$ models the amount, L, in billions of dollars of new student loans x years after 1993. According to the model, in what year is the amount loaned expected to reach $32.25 billion?

A) 2,006 B) 2,005 C) 2,002 D) 2,007

Objective: (0.7) Solve Radical Equations

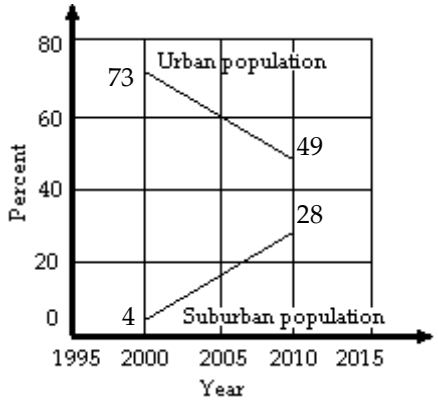
546) A local race for charity has taken place since 1993. In 1993, the winning speed was 6 miles per hour. The winning speed increased, on average, by 0.17 miles per hour each year in the period 1993–1998. If this trend continues, in which year is the winning speed predicted to be 8.04 mph?

A) 2,006 B) 2,005 C) 2,007 D) 2,004

Objective: (0.8) Use Equations to Solve Problems

Test Bank for Precalculus 7th Blitzer

547) The following graph shows that more and more people in a certain country are moving from urban areas to the suburbs. In 2000, the percentage of the population living in urban areas was 73 and this percentage decreased by 2.4 each year, on average, in the period 2000–2010. In 2000, the percentage of the population living in the suburbs was 4 and this percentage increased by 2.4 each year, on average, in the period 2000–2010. Assuming this trend continues, estimate the year in which the percentage of the population living in urban areas will be equal to the percentage living in the suburbs.



A) 2,016 B) 2,015 C) 2,020 D) 2,012

Objective: (0.8) Use Equations to Solve Problems

548) A car rental agency charges $175 per week plus $0.25 per mile to rent a car. How many miles can you travel in one week for $200?

A) 225 mi B) 800 mi C) 75 mi D) 100 mi

Objective: (0.8) Use Equations to Solve Problems

549) A train ticket in a certain city is $2.50. People who use the train also have the option of purchasing a frequent rider pass for $18.75 each month. With the pass, each ticket costs only $1.75. Determine the number of times in a month the train must be used so that the total monthly cost without the pass is the same as the total monthly cost with the pass.

A) 24 times B) 25 times C) 27 times D) 26 times

Objective: (0.8) Use Equations to Solve Problems

550) You inherit $10,000 with the stipulation that for the first year the money must be invested in two stocks paying 6% and 11% annual interest, respectively. How much should be invested at each rate if the total interest earned for the year is to be $800?

A) $7,000 invested at 6%; $3,000 invested at 11%
B) $4,000 invested at 6%; $6,000 invested at 11%
C) $5,000 invested at 6%; $5,000 invested at 11%
D) $6,000 invested at 6%; $4,000 invested at 11%

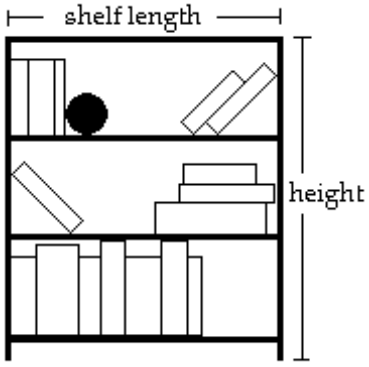
Objective: (0.8) Use Equations to Solve Problems

551) You inherit $56,000 from a very wealthy grandparent, with the stipulation that for the first year, the money must be invested in two stocks paying 4% and 10% annual interest, respectively. How much should be invested at each rate if the total interest earned for the year is to be $3,200?

A) $26,000 invested at 4%; $30,000 invested at 10%
B) $30,000 invested at 4%; $26,000 invested at 10%
C) $40,000 invested at 4%; $16,000 invested at 10%
D) $16,000 invested at 4%; $40,000 invested at 10%

Objective: (0.8) Use Equations to Solve Problems

552) A bookcase is to be constructed as shown in the figure below. The height of the bookcase is 3 feet longer than the length of a shelf. If 24 feet of lumber is available for the entire unit (including the shelves, but NOT the back of the bookcase), find the length and height of the unit.



A) length: 3 ft; height: 6 ft
B) length: 4.5 ft; height: 7.5 ft
C) length: 10.5 ft; height: 13.5 ft
D) length: 3 ft; height: 9 ft

Objective: (0.8) Use Equations to Solve Problems

553) An auto repair shop charged a customer $343 to repair a car. The bill listed $73 for parts and the remainder for labor. If the cost of labor is $45 per hour, how many hours of labor did it take to repair the car?

A) 5 hr
B) 7 hr
C) 6 hr
D) 6.5 hr

Objective: (0.8) Use Equations to Solve Problems

554) After a 17% price reduction, a boat sold for $29,050. What was the boat's price before the reduction? (Round to the nearest cent, if necessary.)

A) $35,000
B) $170,882.35
C) $4,938.50
D) $33,988.50

Objective: (0.8) Use Equations to Solve Problems

555) Inclusive of a 7.2% sales tax, a diamond ring sold for $2,251.20. Find the price of the ring before the tax was added. (Round to the nearest cent, if necessary.)

A) $162.09
B) $2,089.11
C) $2,413.29
D) $2,100

Objective: (0.8) Use Equations to Solve Problems

556) The selling price of a painting is $220. If the markup is 30% of the dealer's cost, what is the dealer's cost of the painting?

A) $6.60
B) $66.00
C) $2,134.00
D) $169.23

Objective: (0.8) Use Equations to Solve Problems

557) The perimeter of a rectangle is 16 cm. The length is 4 cm longer than the width. Find the dimensions.

A) Width: 2 cm; length: 4 cm
B) Width: 4 cm; length: 8 cm
C) Width: 3 cm; length: 7 cm
D) Width: 2 cm; length: 6 cm

Objective: (0.8) Use Equations to Solve Problems

558) The length of a rectangular room is 2 feet longer than twice the width. If the room's perimeter is 184 feet, what are the room's dimensions?

A) Width: 45 ft; length: 47 ft
B) Width: 60 ft; length: 124 ft
C) Width: 30 ft; length: 62 ft
D) Width: 35 ft; length: 72 ft

Objective: (0.8) Use Equations to Solve Problems

559) A diagonal crosswalk at an intersection of First Street and Grand Avenue is the hypotenuse of a triangle in which crosswalks across each street are the legs. First Street is 24 feet wide and Grand Avenue is 40 feet wide. How much shorter is the distance traveled by pedestrians using the diagonal crosswalk rather than using both crosswalks that form the legs of the triangle?

A) 17.4 ft B) 46.6 ft C) 6.6 ft D) 16 ft

Objective: (0.8) Use Equations to Solve Problems

560) There are 14 more sophomores than juniors in an 8 AM algebra class. If there are 46 students in this class, find the number of sophomores and the number of juniors in the class.

A) 60 sophomores; 32 juniors
B) 30 sophomores; 16 juniors
C) 16 sophomores; 30 juniors
D) 46 sophomores; 32 juniors

Objective: (0.8) Use Equations to Solve Problems

561) The president of a certain university makes three times as much money as one of the department heads. If the total of their salaries is $180,000, find each worker's salary.

A) president's salary: $45,000; department head's salary: $135,000
B) president's salary: $90,000; department head's salary: $45,000
C) president's salary: $13,500; department head's salary: $4,500
D) president's salary: $135,000; department head's salary: $45,000

Objective: (0.8) Use Equations to Solve Problems

562) During a road trip, Tony drove one–third the distance that Lana drove. Mark drives 15 more miles than Lana drove. The total distance they drove on the trip was 519 miles. How many miles did each person drive?

A) Tony: 72 mi, Lana: 216 mi, Mark: 231 mi
B) Tony: 67 mi, Lana: 201 mi, Mark: 216 mi
C) Tony: 648 mi, Lana: 216 mi, Mark: 201 mi
D) Tony: 216 mi, Lana: 648 mi, Mark: 663 mi

Objective: (0.8) Use Equations to Solve Problems

563) The sum of the angles of a triangle is 180°. Find the three angles of the triangle if one angle is three times the smallest angle and the third angle is 25° greater than the smallest angle.

A) 22°, 66°, 92° B) 31°, 93°, 56° C) 16°, 48°, 116° D) 16°, 41°, 123°

Objective: (0.8) Use Equations to Solve Problems

564) In a recent International Gymnastics competition, the U.S., China, and Romania were the big winners. If the total number of medals won by each team are three consecutive integers whose sum is 84 and the U.S. won more than China who won more than Romania, how many medals did each team win?

A) U.S.: 86 medals; China: 85 medals; Romania: 84 medals
B) U.S.: 29 medals; China: 28 medals; Romania: 27 medals
C) U.S.: 30 medals; China: 29 medals; Romania: 28 medals
D) U.S.: 27 medals; China: 26 medals; Romania: 25 medals

Objective: (0.8) Use Equations to Solve Problems

565) Sybil is having her yard landscaped. She obtained an estimate from two landscaping companies. Company A gave an estimate of $190 for materials and equipment rental plus $50 per hour for labor. Company B gave an estimate of $280 for materials and equipment rental plus $35 per hour for labor. Determine how many hours of labor will be required for the two companies to cost the same.

A) 10 hr B) 5 hr C) 9 hr D) 6 hr

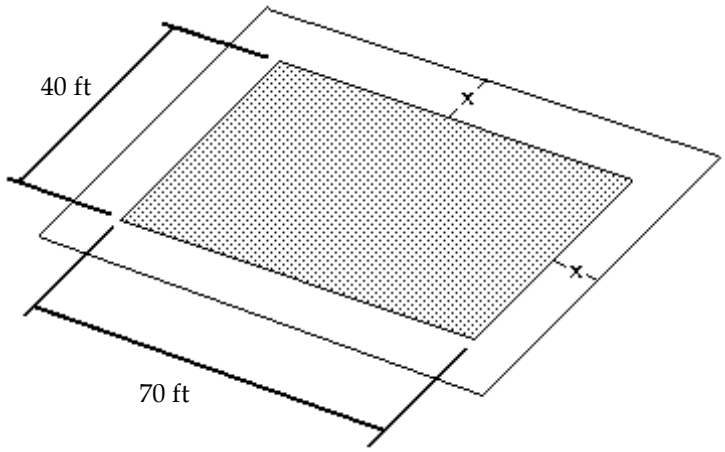
Objective: (0.8) Use Equations to Solve Problems

566) Sergio's internet provider charges its customers $13 per month plus 3¢ per minute of on–line usage. Sergio received a bill from the provider covering a 5–month period and was charged a total of $89.90. How many minutes did he spend on–line during that period? (Round to the nearest whole minute, if necessary.)

A) 1,816 min B) 2,083 min C) 83 min D) 830 min

Objective: (0.8) Use Equations to Solve Problems

567) The rectangular swimming pool in the figure shown measures 40 feet by 70 feet and contains a path of uniform width around the four edges. The perimeter of the rectangle formed by the pool and the surrounding path is 244 feet. Determine the width of the path.



A) 33.5 ft B) 9 ft C) 3 ft D) 6 ft

Objective: (0.8) Use Equations to Solve Problems

568) A rectangular parking lot has a length that is 5 yards greater than the width. The area of the parking lot is 176 square yards. Find the length and the width.

A) Width: 6 yd; length: 11 yd
B) Width: 21 yd; length: 26 yd
C) Width: 16 yd; length: 21 yd
D) Width: 11 yd; length: 16 yd

Objective: (0.8) Use Equations to Solve Problems

569) Each side of a square is lengthened by 3 inches. The area of this new, larger square is 100 square inches. Find the length of a side of the original square.

A) 4 in. B) 10 in. C) 7 in. D) 9 in.

Objective: (0.8) Use Equations to Solve Problems

570) Use the formula Time traveled $= \frac{\text{Distance traveled}}{\text{Average Velocity}}$. A passenger train can travel 270 miles in the same amount of time it takes a freight train to travel 180 miles. If the average velocity of the freight train is 15 miles per hour slower than the average velocity of the passenger train, find the average velocity of each.

A) passenger train: 60 mph
freight train: 45 mph
B) passenger train: 75 mph
freight train: 60 mph
C) passenger train: 30 mph
freight train: 15 mph
D) passenger train: 45 mph
freight train: 30 mph

Objective: (0.8) Use Equations to Solve Problems

Test Bank for Precalculus 7th Blitzer

571) A cruise boat travels 84 miles downstream in 3 hours and returns to its starting point upstream in 6 hours. Find the speed of the stream.

A) 7 mph B) 21 mph C) 49 mph D) 28 mph

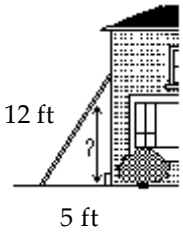
Objective: (0.8) Use Equations to Solve Problems

572) Judy has a rectangular garden 14 by 22 feet. She wants to put a grass border around the garden with a uniform width on all sides. If she has enough grass seed to cover 460 square feet, how wide can the grass border be?

A) 5 ft B) 2.5 ft C) 10 ft D) 7 ft

Objective: (0.8) Use Equations to Solve Problems

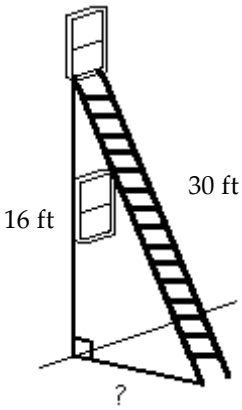
573) A 12–foot ladder is leaning against a house with the base of the ladder 5 feet from the house. How high up the house does the ladder reach? If necessary, round to the nearest tenth foot.



A) 11 ft B) 10.9 ft C) 7 ft D) 13 ft

Objective: (0.8) Use Equations to Solve Problems

574) A 30–ft–tall ladder is placed so that it reaches 16 ft up on the wall of a house. How far is the base of the ladder from the wall of the house? If necessary, round to the nearest tenth foot.



A) 644 ft B) 34 ft C) 25.4 ft D) 1,156 ft

Objective: (0.8) Use Equations to Solve Problems

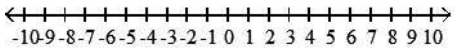
575) Two cars leave an intersection. One car travels north; the other east. When the car traveling north had gone 6 miles, the distance between the cars was 2 miles more than the distance traveled by the car heading east. How far had the east bound car traveled?

A) 12 mi B) 6 mi C) 8 mi D) 10 mi

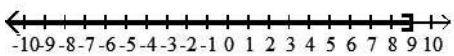
Objective: (0.8) Use Equations to Solve Problems

Express the interval in set–builder notation and graph the interval on a number line.

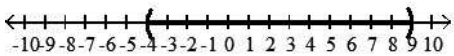
576) $(-4, 9]$



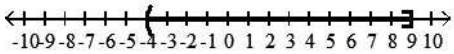
A) $\{x \mid x \le 9\}$



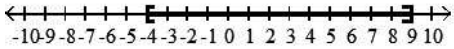
B) $\{x \mid -4 < x < 9\}$



C) $\{x \mid -4 < x \le 9\}$

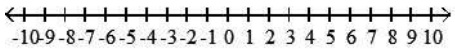


D) $\{x \mid -4 \le x \le 9\}$

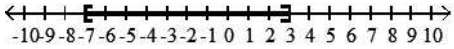


Objective: (0.9) Use Interval Notation

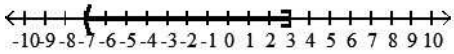
577) $[-7, 3)$



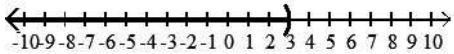
A) $\{x \mid -7 \le x \le 3\}$



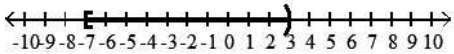
B) $\{x \mid -7 < x \le 3\}$



C) $\{x \mid x < 3\}$

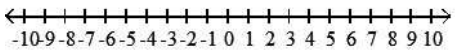


D) $\{x \mid -7 \le x < 3\}$

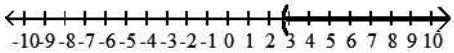


Objective: (0.9) Use Interval Notation

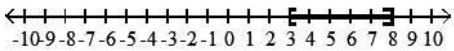
578) $\left(-\infty, \frac{8}{3}\right]$



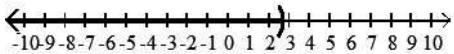
A) $\left\{x \mid x > \frac{8}{3}\right\}$



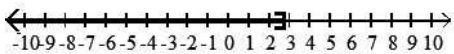
B) $\{x \mid 3 \le x \le 8\}$



C) $\left\{x \mid x < \frac{8}{3}\right\}$

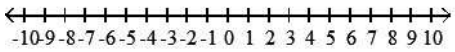


D) $\left\{x \mid x \le \frac{8}{3}\right\}$

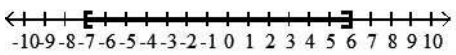


Objective: (0.9) Use Interval Notation

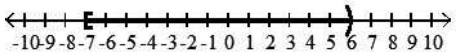
579) [−7, 6]



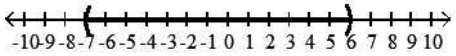
A) {x | −7 ≤ x ≤ 6}



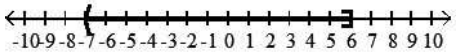
B) {x | −7 ≤ x < 6}



C) {x | −7 < x < 6}

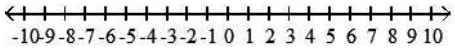


D) {x | −7 < x ≤ 6}

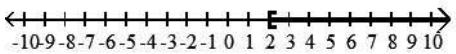


Objective: (0.9) Use Interval Notation

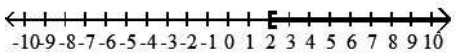
580) (2, ∞)



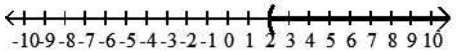
A) {x | x > 2}



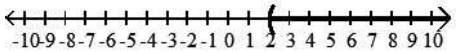
B) {x | x ≥ 2}



C) {x | x > 2}

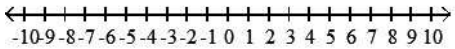


D) {x | x ≥ 2}

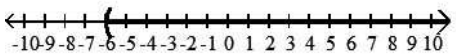


Objective: (0.9) Use Interval Notation

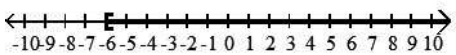
581) [−6, ∞)



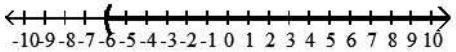
A) {x | x ≥ −6}



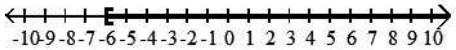
B) {x | x ≥ −6}



C) {x | x > −6}

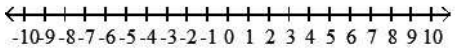


D) {x | x > −6}

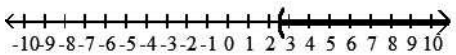


Objective: (0.9) Use Interval Notation

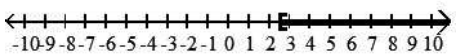
582) (−∞, 2.5]



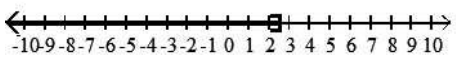
A) {x | x > 2.5}



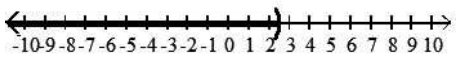
B) {x | x ≥ 2.5}



C) {x | x ≤ 2.5}



D) {x | x < 2.5}



Objective: (0.9) Use Interval Notation

Test Bank for Precalculus 7th Blitzer

Use graphs to find the set.

583) $(-10, 0) \cap [-3, 2]$

A) $(0, 2]$ B) $(-10, 2]$ C) $[-3, 0)$ D) $(-10, -3]$

Objective: (0.9) Find Intersections and Unions of Intervals

584) $(-9, 0) \cup [-2, 3]$

A) $(-9, 3]$ B) $[-2, 0)$ C) $(-9, -2]$ D) $(0, 3]$

Objective: (0.9) Find Intersections and Unions of Intervals

585) $(-\infty, 7) \cap [-7, 19)$

A) $(-\infty, -7]$ B) $(7, 19)$ C) $(-\infty, 19)$ D) $[-7, 7)$

Objective: (0.9) Find Intersections and Unions of Intervals

586) $(-\infty, 9) \cup [-3, 11)$

A) $(-\infty, -3]$ B) $(9, 11)$ C) $[-3, 9)$ D) $(-\infty, 11)$

Objective: (0.9) Find Intersections and Unions of Intervals

587) $(9, \infty) \cap [18, \infty)$

A) $[18, \infty)$ B) $(-\infty, \infty)$ C) $(9, \infty)$ D) $(9, 18]$

Objective: (0.9) Find Intersections and Unions of Intervals

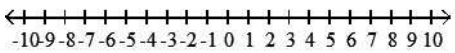
588) $(8, \infty) \cup [11, \infty)$

A) $(8, 11]$ B) $[11, \infty)$ C) $(8, \infty)$ D) $(-\infty, \infty)$

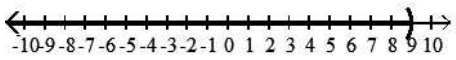
Objective: (0.9) Find Intersections and Unions of Intervals

Solve the linear inequality. Other than $\emptyset$, use interval notation to express the solution set and graph the solution set on a number line.

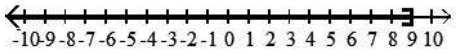
589) $4x + 1 < 37$



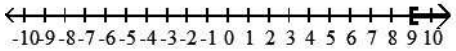
A) $(-\infty, 9)$



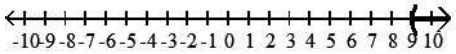
B) $(-\infty, 9]$



C) $[9, \infty)$

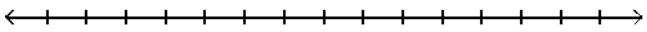


D) $(9, \infty)$

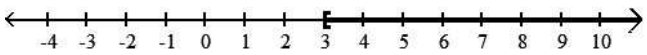


Objective: (0.9) Solve Linear Inequalities

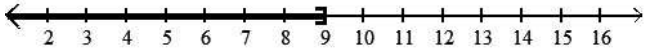
590) $4x - 12 \geq 24$



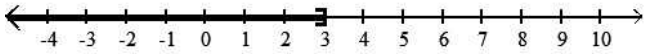
A) $[3, \infty)$



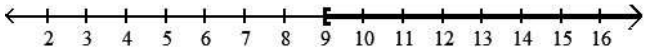
B) $(-\infty, 9]$



C) $(-\infty, 3]$

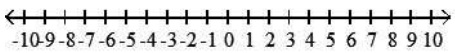


D) $[9, \infty)$

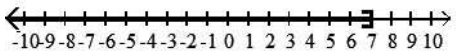


Objective: (0.9) Solve Linear Inequalities

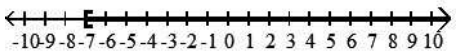
591) $-9x \geq 63$



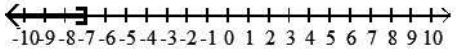
A) $(-\infty, 7]$



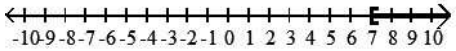
B) $[-7, \infty)$



C) $(-\infty, -7]$

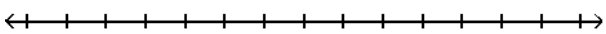


D) $[7, \infty)$

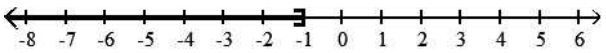


Objective: (0.9) Solve Linear Inequalities

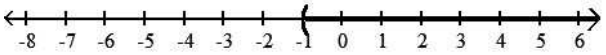
592) $4x - 2 > 3x - 3$



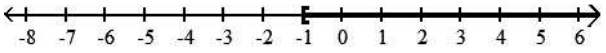
A) $(-\infty, -1]$



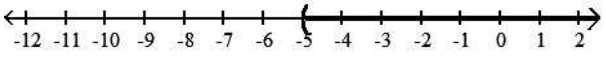
B) $(-1, \infty)$



C) $[-1, \infty)$

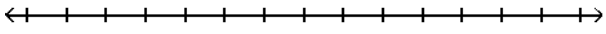


D) $(-5, \infty)$

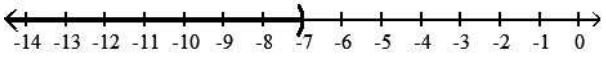


Objective: (0.9) Solve Linear Inequalities

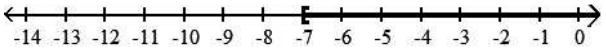
593) $3x + 1 \geq 2x - 6$



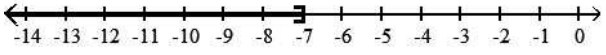
A) $(-\infty, -7)$



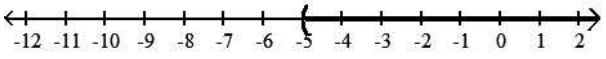
B) $[-7, \infty)$



C) $(-\infty, -7]$



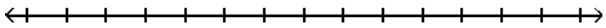
D) $(-5, \infty)$



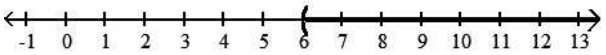
Objective: (0.9) Solve Linear Inequalities

Test Bank for Precalculus 7th Blitzer

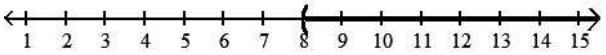
594) $10x + 2 > 2(4x + 7)$



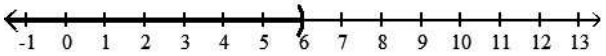
A) $(6, \infty)$



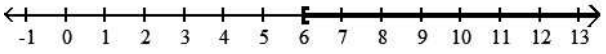
B) $(8, \infty)$



C) $(-\infty, 6)$

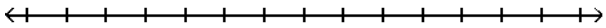


D) $[6, \infty)$

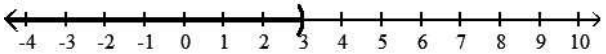


Objective: (0.9) Solve Linear Inequalities

595) $-2(6x + 8) < -14x - 10$

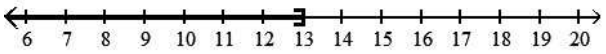


A) $(-\infty, 3)$

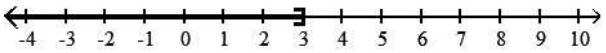


B) $(3, \infty)$

C) $(-\infty, 13]$

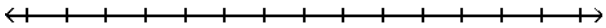


D) $(-\infty, 3]$

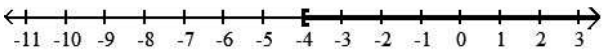


Objective: (0.9) Solve Linear Inequalities

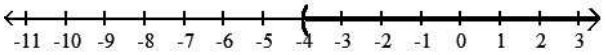
596) $-15x + 5 \leq -5(2x - 5)$



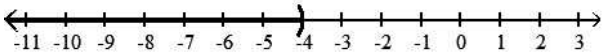
A) $[-4, \infty)$



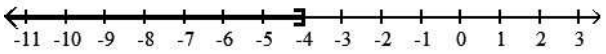
B) $(-4, \infty)$



C) $(-\infty, -4)$

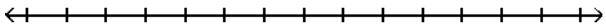


D) $(-\infty, -4]$

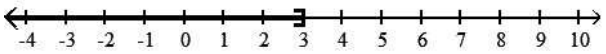


Objective: (0.9) Solve Linear Inequalities

597) $8x + 4 \leq 2(3x + 5)$

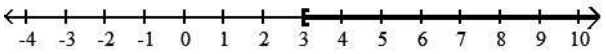


A) $(-\infty, 3]$

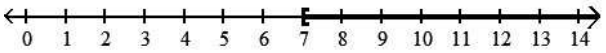


B) $(-\infty, 3)$

C) $[3, \infty)$

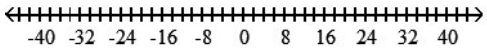


D) $[-\infty, 7)$

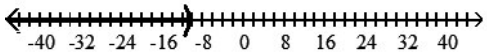


Objective: (0.9) Solve Linear Inequalities

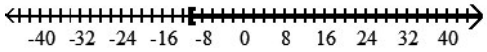
598) $\frac{x}{5} - \frac{1}{5} \le \frac{x}{2} + 3$



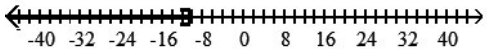
A) $\left(-\infty, -\frac{32}{3}\right)$



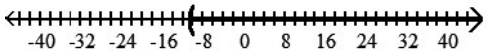
B) $\left[-\frac{32}{3}, \infty\right)$



C) $\left(-\infty, -\frac{32}{3}\right]$

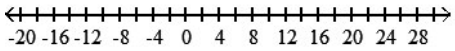


D) $\left(-\frac{32}{3}, \infty\right)$

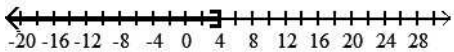


Objective: (0.9) Solve Linear Inequalities

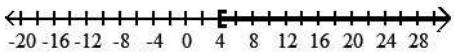
599) $\frac{x-3}{16} \ge \frac{x-3}{20} + \frac{1}{80}$



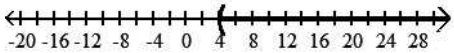
A) $(-\infty, 4]$



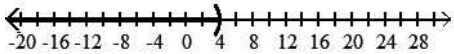
B) $[4, \infty)$



C) $(4, \infty)$



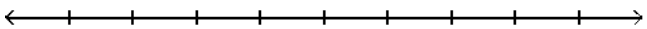
D) $(-\infty, 4)$



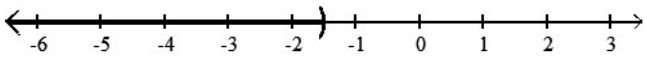
Objective: (0.9) Solve Linear Inequalities

Test Bank for Precalculus 7th Blitzer

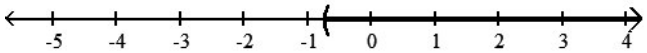
600) $\frac{2}{3} - \frac{8}{9}x < 2$



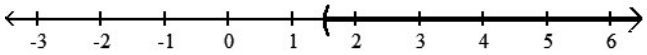
A) $\left(-\infty, -\frac{3}{2}\right]$



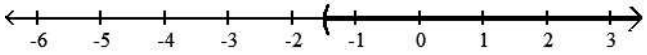
B) $\left(-\frac{3}{4}, \infty\right]$



C) $\left[\frac{3}{2}, \infty\right)$

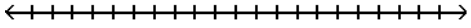


D) $\left[-\frac{3}{2}, \infty\right)$

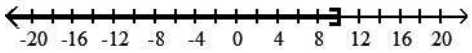


Objective: (0.9) Solve Linear Inequalities

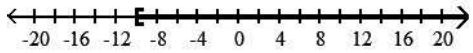
601) $\frac{x}{2} \geq \frac{x}{10} + 4$



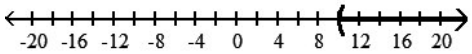
A) $(-\infty, 10]$



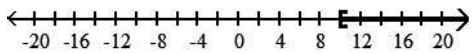
B) $[-10, \infty)$



C) $(10, \infty)$



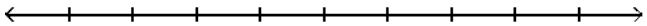
D) $[10, \infty)$



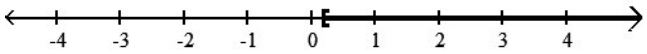
Objective: (0.9) Solve Linear Inequalities

Test Bank for Precalculus 7th Blitzer

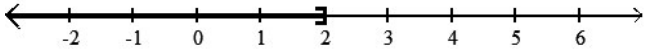
602) $\frac{x}{18} \leq \frac{x}{3} - \frac{3x+1}{9}$



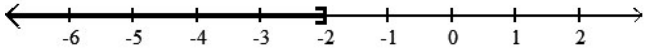
A) $\left[\frac{2}{11}, \infty\right)$



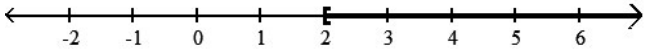
B) $(-\infty, 2]$



C) $(-\infty, -2]$

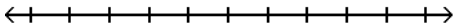


D) $[2, \infty)$

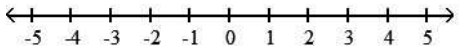


Objective: (0.9) Solve Linear Inequalities

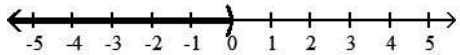
603) $-4(-2 - x) < 6x + 19 - 11 - 2x$



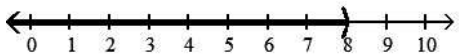
A) $\emptyset$



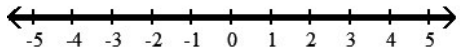
B) $(-\infty, 0)$



C) $(-\infty, 8)$



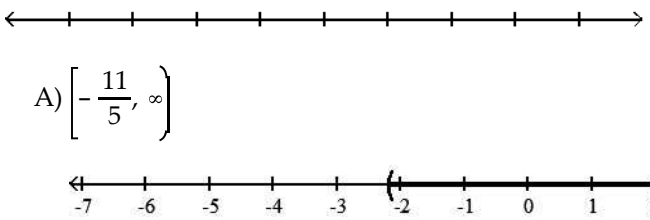
D) $(-\infty, \infty)$



Objective: (0.9) Solve Linear Inequalities

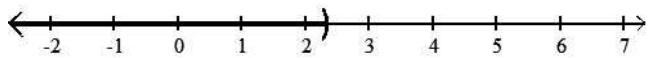
Test Bank for Precalculus 7th Blitzer

604) $-4(2x + 1) \geq 2[4x - 3(x - 3)]$

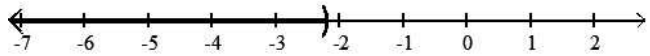


A) $\left[-\frac{11}{5}, \infty\right)$

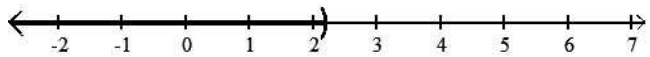
B) $\left(-\infty, \frac{7}{3}\right]$



C) $\left(-\infty, -\frac{11}{5}\right]$



D) $\left(-\infty, \frac{11}{5}\right]$



Objective: (0.9) Solve Linear Inequalities

Solve the problem.

605) When making a long distance call from a certain pay phone, the first three minutes of a call cost $2.25. After that, each additional minute or portion of a minute of that call costs $0.25. Use an inequality to find the number of minutes one can call long distance for $5.00.

A) 14 minutes or fewer
B) 20 minutes or fewer
C) 11 minutes or fewer
D) 2 minutes or fewer

Objective: (0.9) Solve Linear Inequalities

606) It takes 19 minutes to set up a candy making machine. Once the machine is set up, it produces 12 candies per minute. Use an inequality to find the number of candies that can be produced in 7 hours if the machine has not yet been set up.

A) 7,752 candies or fewer
B) 1,596 candies or fewer
C) 84 candies or fewer
D) 4,812 candies or fewer

Objective: (0.9) Solve Linear Inequalities

607) A certain store has a fax machine available for use by its customers. The store charges $2.00 to send the first page and $0.65 for each subsequent page. Use an inequality to find the number of pages that can be faxed for $4.60.

A) 7 pages or fewer
B) 5 pages or fewer
C) 44 pages or fewer
D) 2 pages or fewer

Objective: (0.9) Solve Linear Inequalities

608) Claire has received scores of 85, 88, 87, and 75 on her algebra tests. What score must she receive on the fifth test to have an overall test score average of at least 83?

A) 78 or greater
B) 81 or greater
C) 80 or greater
D) 79 or greater

Objective: (0.9) Solve Linear Inequalities

Test Bank for Precalculus 7th Blitzer

609) Using data from 1996–1998, the annual number of cars sold at a certain dealership can be modeled by the formula

$$y = 2x + 2,$$

where y is the number of cars, in thousands, sold x years after 1996. According to this formula, in which years will the number of cars sold exceed 16 thousand?

A) Years after 2,005 B) Years after 2,003 C) Years after 2,001 D) Years after 2,007

Objective: (0.9) Solve Linear Inequalities

610) ABC phone company charges $21 per month plus 3¢ per minute of phone calls. XYZ phone company charges $9 per month plus 5¢ per minute of phone calls. How many minutes of phone calls in a month make XYZ phone company the better deal?

A) Less than 60 minutes B) Less than 600 minutes

C) More than 60 minutes D) More than 600 minutes

Objective: (0.9) Solve Linear Inequalities

611) Greg is opening a car wash. He estimates his cost equation as $C = 7{,}000 + 0.07x$ and his revenue equation as $R = 1.8x$, where x is the number of cars washed in a six–month period. Find the number of cars that must be washed in a six–month period for Greg to make a profit.

A) At least 405 cars B) At least 40,463 cars C) At least 3,047 cars D) At least 4,047 cars

Objective: (0.9) Solve Linear Inequalities

612) A standard train ticket in a certain city costs $2.50 per ride. People who use the train also have the option of purchasing a frequent–rider pass for $15.75 each month. With the pass, a ticket costs only $1.75 per ride. How many train rides in a month make the frequent–rider pass a better deal than standard train tickets?

A) 21 or more rides B) 22 or more rides C) 23 or more rides D) 20 or more rides

Objective: (0.9) Solve Linear Inequalities

613) Every Sunday, Jarod buys a loaf of fresh bread for his family from the corner bakery for $4.00. The local department store has a sale on breadmakers for $61. If the bread–making supplies cost $0.67 per week, for how many weeks would Jarod have to bake a loaf of bread at home before the breadmaker starts saving him money?

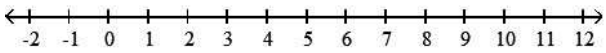
A) At least 19 weeks B) At least 21 weeks C) At least 20 weeks D) At least 18 weeks

Objective: (0.9) Solve Linear Inequalities

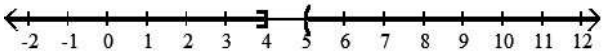
Test Bank for Precalculus 7th Blitzer

Solve the compound inequality. Other than ∅, use interval notation to express the solution set and graph the solution set on a number line.

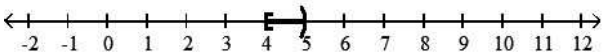
614) $8 < 2x \leq 10$



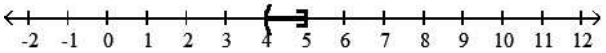
A) $(-\infty, 4] \cup (5, \infty)$



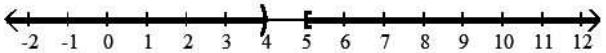
B) [4, 5)



C) (4, 5]

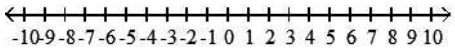


D) $(-\infty, 4) \cup [5, \infty)$

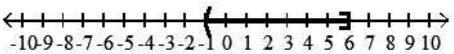


Objective: (0.9) Solve Compound Inequalities

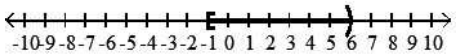
615) $-4 < x + 3 \leq 3$



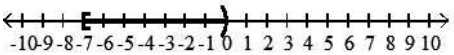
A) (−1, 6]



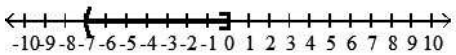
B) [−1, 6)



C) [−7, 0)

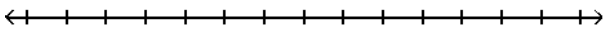


D) (−7, 0]

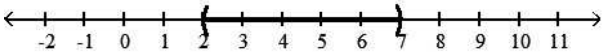


Objective: (0.9) Solve Compound Inequalities

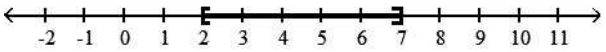
616) $2 \le 3x - 4 \le 17$



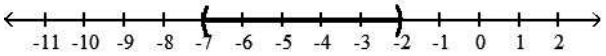
A) (2, 7)



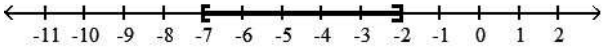
B) [2, 7]



C) (−7, −2)

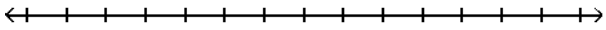


D) [−7, −2]

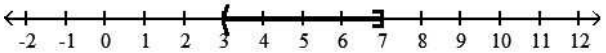


Objective: (0.9) Solve Compound Inequalities

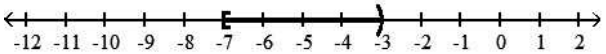
617) $-31 \le -5x + 4 < -11$



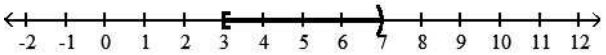
A) (3, 7]



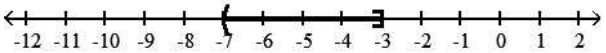
B) [−7, −3)



C) [3, 7)

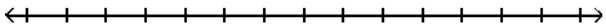


D) (−7, −3]

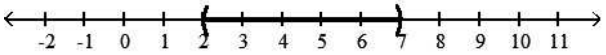


Objective: (0.9) Solve Compound Inequalities

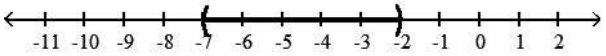
618) $-23 \le -3x - 2 \le -8$



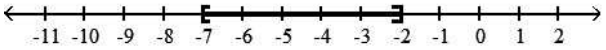
A) (2, 7)



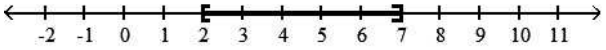
B) (−7, −2)



C) [−7, −2]

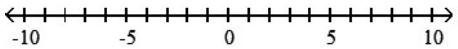


D) [2, 7]

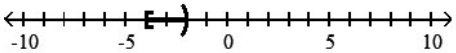


Objective: (0.9) Solve Compound Inequalities

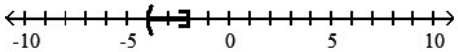
619) $-4 \le -4x - 12 < 4$



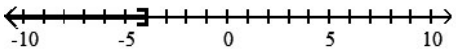
A) [−4, −2)



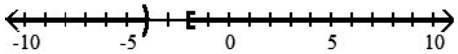
B) (−4, −2]



C) (−∞, −4]

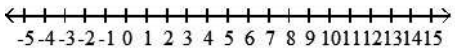


D) (−∞, −4) or [−2, ∞)

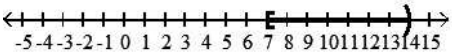


Objective: (0.9) Solve Compound Inequalities

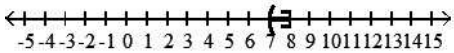
620) $11 \le \frac{6}{7}x + 5 < 17$



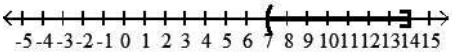
A) [7, 14)



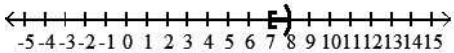
B) (7, 8]



C) (7, 14]



D) [7, 8)



Objective: (0.9) Solve Compound Inequalities

Test Bank for Precalculus 7th Blitzer

Solve the problem.

621) The formula for converting Fahrenheit temperature, F, to Celsius temperature, C, is

$$C = \frac{5}{9}(F - 32).$$

If Celsius temperature ranges from 50° to 100°, inclusive, what is the range for the Fahrenheit temperature?

A) [−12°F, −7°F] B) (122°F, 212°F) C) (−12°F, −7°F) D) [122°F, 212°F]

Objective: (0.9) Solve Compound Inequalities

622) The formula for converting Celsius temperature, C, to Fahrenheit temperature, F, is

$$F = \frac{9}{5}C + 32.$$

If Fahrenheit temperature ranges from 50° to 122°, inclusive, what is the range for the Celsius temperature?

A) [122°C, 252°C] B) (10°C, 50°C)

C) (122°C, 252°C) D) [10°C, 50°C]

Objective: (0.9) Solve Compound Inequalities

623) On the first four exams, your grades are 77, 84, 69, and 78. You are hoping to earn a C in the course. This will occur if the average of your five exam grades is greater than or equal to 70 and less than 80. What range of grades on the fifth exam will result in earning a C?

A) (32, 82] B) [42, 92) C) (42, 92] D) [32, 82)

Objective: (0.9) Solve Compound Inequalities

624) On the first four exams, your grades are 78, 94, 61, and 79. There is still a final exam, and it counts as two grades. You are hoping to earn a C in the course. This will occur if the average of your six exam grades is greater than or equal to 70 and less than 80. What range of grades on the final exam will result in earning a C?

A) [38, 88) B) [54, 84) C) [54, 84] D) [38, 88]

Objective: (0.9) Solve Compound Inequalities

625) Parts for an automobile repair cost $464. The mechanic charges $29 per hour. If you receive an estimate for at least $609 and at most $696 for fixing the car, what is the time interval, in hours, that the mechanic will be working on the job?

A) [1, 8] B) [21, 24] C) [1, 5] D) [5, 8]

Objective: (0.9) Solve Compound Inequalities

626) The formula $C = 0.5x + 20$ represents the estimated future cost of yearly attendance at State University, where C is the cost in thousands of dollars x years after 2002. Use a compound inequality to determine when the attendance costs will range from 24 to 26 thousand dollars.

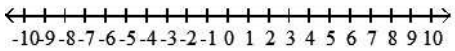
A) From 2,010 to 2,014 B) From 2,011 to 2,013 C) From 2,011 to 2,015 D) From 2,009 to 2,013

Objective: (0.9) Solve Compound Inequalities

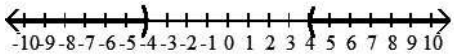
Test Bank for Precalculus 7th Blitzer

Solve the absolute value inequality. Other than ∅, use interval notation to express the solution set and graph the solution set on a number line.

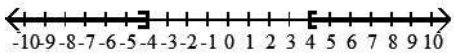
627) $|x| < 4$



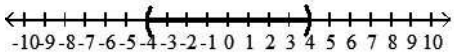
A) $(-\infty, -4) \cup (4, \infty)$



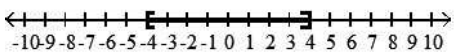
B) $(-\infty, -4] \cup [4, \infty)$



C) $(-4, 4)$

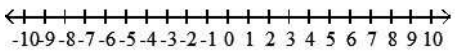


D) $[-4, 4]$

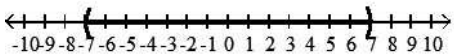


Objective: (0.9) Solve Absolute Value Inequalities

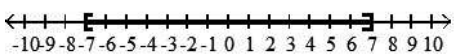
628) $|x| > 7$



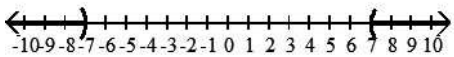
A) $(-7, 7)$



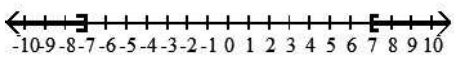
B) $[-7, 7]$



C) $(-\infty, -7) \cup (7, \infty)$

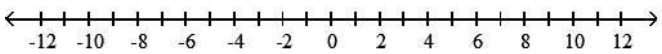


D) $(-\infty, -7] \cup [7, \infty)$

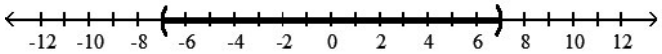


Objective: (0.9) Solve Absolute Value Inequalities

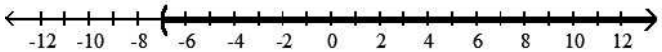
629) $|x - 7| < 0$



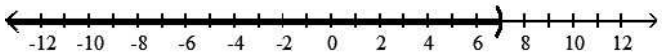
A) $(-7, 7)$



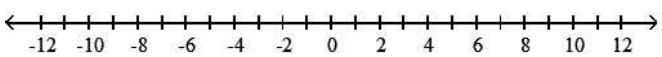
B) $(-7, \infty)$



C) $(-\infty, 7)$



D) $\emptyset$



Objective: (0.9) Solve Absolute Value Inequalities

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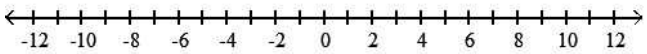
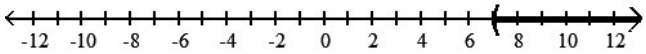
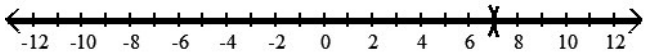
630) $|x - 7| > 0$



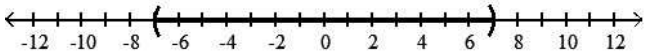
A) $(7, \infty)$



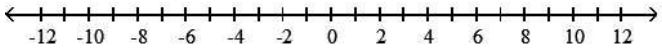
B) $(-\infty, 7) \cup (7, \infty)$



C) $(-7, 7)$

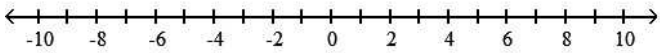


D) $\emptyset$

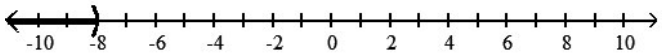


Objective: (0.9) Solve Absolute Value Inequalities

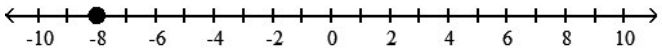
631) $|x + 8| \leq 0$



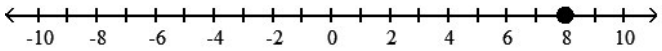
A) $(-\infty, -8)$



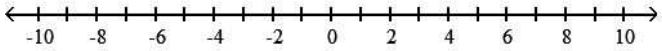
B) $\{-8\}$



C) $\{8\}$

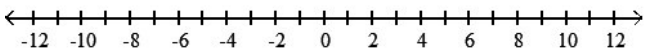


D) $\emptyset$

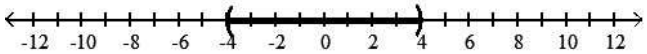


Objective: (0.9) Solve Absolute Value Inequalities

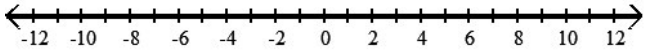
632) $|x + 4| \geq 0$



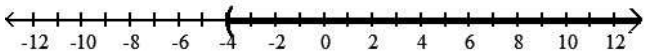
A) (−4, 4)



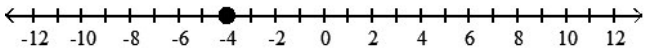
B) (−∞, ∞)



C) (−4, ∞)

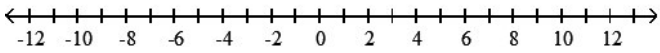


D) {−4}

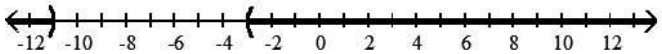


Objective: (0.9) Solve Absolute Value Inequalities

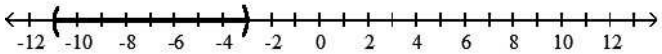
633) $|x + 7| < 4$



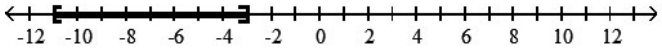
A) (−∞, −11) ∪ (−3, ∞)



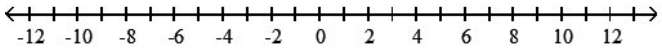
B) (−11, −3)



C) [−11, −3]

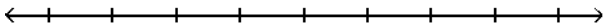


D) ∅

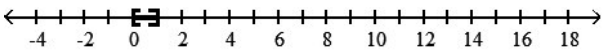


Objective: (0.9) Solve Absolute Value Inequalities

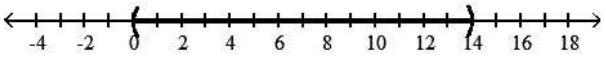
634) $|x - 7| - 6 \leq 1$



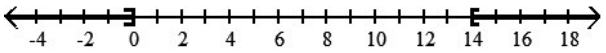
A) [0, 1]



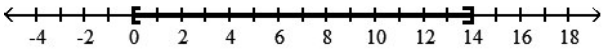
B) (0, 14)



C) $(-\infty, 0] \cup [14, \infty)$

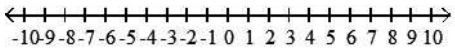


D) [0, 14]

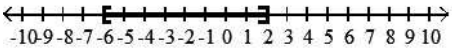


Objective: (0.9) Solve Absolute Value Inequalities

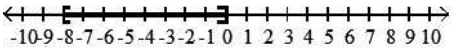
635) $|\,3(x + 1) + 9\,| \leq 12$



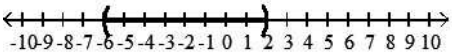
A) [−6, 2]



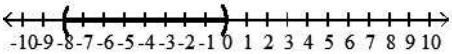
B) [−8, 0]



C) (−6, 2)

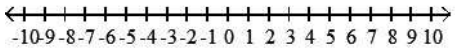


D) (−8, 0)

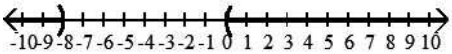


Objective: (0.9) Solve Absolute Value Inequalities

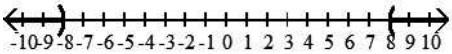
636) $\left|\dfrac{3y + 12}{4}\right| < 3$



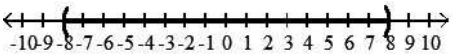
A) $(-\infty, -8) \cup (0, \infty)$



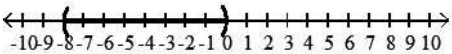
B) $(-\infty, -8) \cup (8, \infty)$



C) (−8, 8)

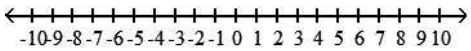


D) (−8, 0)

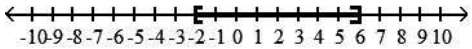


Objective: (0.9) Solve Absolute Value Inequalities

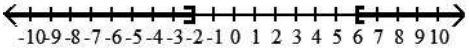
637) $8 + \left|1 - \frac{x}{2}\right| \geq 10$



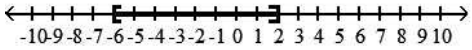
A) $[-2, 6]$



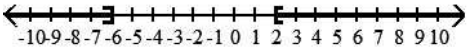
B) $(-\infty, -2] \cup [6, \infty)$



C) $[-6, 2]$

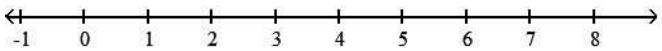


D) $(-\infty, -6] \cup [2, \infty)$

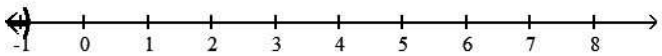


Objective: (0.9) Solve Absolute Value Inequalities

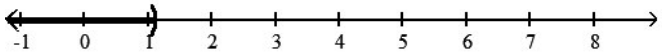
638) $|8x - 1| + 3 < -5$



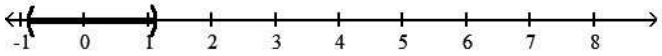
A) $\left(-\infty, -\frac{7}{8}\right]$



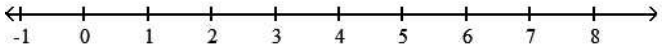
B) $\left(-\infty, \frac{9}{8}\right]$



C) $\left(-\frac{7}{8}, \frac{9}{8}\right]$



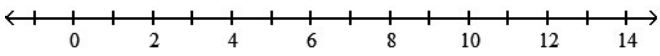
D) $\varnothing$



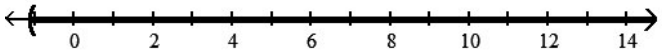
Objective: (0.9) Solve Absolute Value Inequalities

Test Bank for Precalculus 7th Blitzer

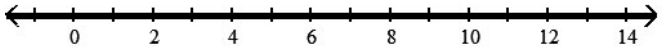
639) $|7x - 1| + 1 > -8$



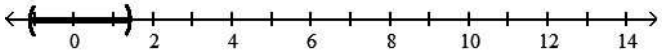
A) $\left(-\frac{8}{7}, \infty\right]$



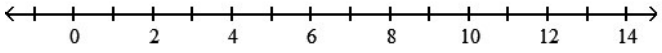
B) $(-\infty, \infty)$



C) $\left(-\frac{8}{7}, \frac{10}{7}\right]$



D) $\emptyset$



Objective: (0.9) Solve Absolute Value Inequalities

Solve the problem.

640) A spinner has ten regions numbered 1 through 10. If the spinner is spun 100 times, we would expect about 10 of the outcomes to be Region 1. It can be determined that the spinner is unbalanced if x, the number of outcomes that result in Region 1, satisfies $\left|\frac{x - 10}{3}\right| \geq 1.645$. Describe the number of outcomes that determine an unbalanced spinner that is spun 100 times.

A) Fewer than 9 or more than 17 outcomes
B) Fewer than 6 or more than 14 outcomes
C) Between 6 and 14 outcomes
D) Between 9 and 17 outcomes

Objective: (0.9) Solve Absolute Value Inequalities

641) When a number is subtracted from −7, the absolute value of the difference is more than 3. Use interval notation to express the set of all numbers that satisfy this condition.

A) $(-10, -4)$
B) $(-\infty, -4) \cup (10, \infty)$
C) $(-\infty, -10) \cup (-4, \infty)$
D) $(-\infty, -10] \cup [-4, \infty)$

Objective: (0.9) Solve Absolute Value Inequalities

642) A landscaping company sells 40−pound bags of top soil. The actual weight x of a bag, however, may differ from the advertised weight by as much as 0.75 pound. Write an inequality involving absolute value that expresses the relationship between the actual weight x of a bag and 40 pounds. Solve the inequality, and express the answer in interval form.

A) $|x + 0.75| \leq 40$; $[39.25, \infty)$
B) $|40 + x| \leq 0.75$; $[39.25, 40.75]$
C) $|40 - x| \leq 0.75$; $[39.25, 40.75]$
D) $|x| - 40 \leq 0.75$; $(-\infty, 40.75]$

Objective: (0.9) Solve Absolute Value Inequalities

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MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Evaluate the algebraic expression for the given value or values of the variable(s).

1) $8x + 5$; $x = 7$

A) 112 B) 61 C) 13 D) 51

Answer: B

2) $-5x - 9$; $x = -1$

A) 14 B) 4 C) −14 D) −4

Answer: D

3) $3(x + 2) + 8$; $x = -9$

A) 13 B) −40 C) −13 D) 56

Answer: C

4) $6x^2 + 8y$; $x = 4$ and $y = 7$

A) 632 B) 152 C) 1,008 D) 326

Answer: B

5) $(x + 2y)^2$; $x = 3$ and $y = 4$

A) 11 B) 22 C) 25 D) 121

Answer: D

6) $6 + 6(x - 5)^3$; $x = 7$

A) 54 B) 96 C) 18 D) −42

Answer: A

7) $x^2 - 3(x - y)$; $x = 8$ and $y = 2$

A) 38 B) 42 C) 46 D) −82

Answer: C

8) $\frac{9(x - 7)}{2x + 8}$; $x = 5$

A) −2 B) $-\frac{9}{2}$ C) 6 D) − 1

Answer: D

9) $\frac{y - 6x}{4x + xy}$; $x = -2$ and $y = 1$

A) $\frac{11}{10}$ B) $\frac{11}{6}$ C) $-\frac{13}{10}$ D) $-\frac{1}{2}$

Answer: C

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Solve.

10) The formula $C = \frac{5}{9}(F - 32)$ expresses the relationship between Fahrenheit temperature, F, and Celsius temperature, C. Use the formula to convert 104°F to its equivalent temperature on the Celsius scale.

A) 76°C B) 130°C C) 40°C D) 8°C

Answer: C

11) A stone is dropped from a tower that is 760 feet high. The formula $h = 760 - 16t^2$ describes the stone's height above the ground, h, in feet, t seconds after it was dropped. What is the stone's height 5 seconds after it is released?

A) 370 ft B) 385 ft C) 335 ft D) 360 ft

Answer: D

12) If a rock falls from a height of 60 meters above the ground, the height H (in meters) after x seconds can be approximated using the formula $H = 60 - 4.9x^2$. What is the height of the rock after 2 seconds?

A) 50.2 m B) 40.4 m C) 220.4 m D) –36.04 m

Answer: B

13) As the relative humidity increases, the temperature seems higher than it is. The formula $T = 0.118x + 77.98$ approximates the apparent temperature for an actual temperature of 85°F, where x is the relative humidity. What is the apparent temperature (to the nearest degree) for a relative humidity of 60%?

A) 138°F B) 552°F C) 78°F D) 85°F

Answer: D

14) The winning times (in seconds) in a speed–skating event for men can be represented by the formula $T = 46.92 - 0.098x$, where x represents the year, with x = 0 corresponding to 1920. (For example in 1992, x would be 1992 – 1920 = 72.) According to the formula, what was the winning time in 1963? Round to the nearest hundredth.

A) 42.71 sec B) 43.69 sec C) 44.67 sec D) 2,013.35 sec

Answer: A

15) It is estimated that y, the number of items of a particular commodity (in millions) sold in the United States in year x, where x represents the number of years since 1990, is given by the formula $y = 1.66x + 3.92$. That is, x = 0 represents 1990, x = 1 represents 1991, and so on. According to the formula, how many items sold in 1999?

A) 3.92 millions B) 20.52 millions C) 18.86 millions D) 50.22 millions

Answer: C

Find the intersection of the two sets.

16) $\{1, 10, 4, 9\} \cap \{4, 11, 1\}$

A) $\{1, 4, 9, 10, 11\}$ B) $\{1, 4\}$ C) $\varnothing$ D) $\{1\}$

Answer: B

17) $\{1, 3, 8\} \cap \{4, 11\}$

A) $\{1, 4, 8, 3, 11\}$ B) $\varnothing$ C) $\{1, 8\}$ D) $\{3, 8\}$

Answer: B

18) $\{4, 6, 7, 9\} \cap \varnothing$

A) $\{4, 6, 7, 9\}$ B) $\varnothing$ C) $\{4, 6\}$ D) $\{7, 9\}$

Answer: B

Test Bank for Precalculus 7th Blitzer

Find the union of the two sets.

19) $\{2, 4, 8, 11\} \cup \{2, 4, 13\}$

A) $\{2, 4, 8, 11, 13\}$ B) $\{8, 11, 13\}$ C) $\{2, 4\}$ D) $\varnothing$

Answer: A

20) $\{2, 10\} \cup \{2, 5, 8\}$

A) $\varnothing$ B) $\{5, 8, 10\}$ C) $\{2\}$ D) $\{2, 5, 8, 10\}$

Answer: D

21) $\{8, 10, 11, 13\} \cup \varnothing$

A) $\{8, 10\}$ B) $\{11, 13\}$ C) $\varnothing$ D) $\{8, 10, 11, 13\}$

Answer: D

List all numbers from the given set B that are members of the given Real Number subset.

22) $B = \{11, \sqrt{5}, -8, 0, 0.\overline{8}, \sqrt{9}\}$ Integers

A) $11, 0, \sqrt{9}$ B) $11, -8, 0, \sqrt{9}$ C) $11, -8, 0$ D) $11, 0$

Answer: B

23) $B = \{11, \sqrt{6}, -6, 0, 0.\overline{8}, \sqrt{25}\}$ Whole numbers

A) $11, 0, \sqrt{25}$ B) $11, 0$ C) $11, -6, 0$ D) $11, -6, 0, \sqrt{25}$

Answer: A

24) $B = \{4, \sqrt{5}, -6, 0, 0.\overline{6}, \sqrt{9}\}$ Natural numbers

A) $4, 0, \sqrt{9}$ B) $4, 0$ C) $4, \sqrt{9}$ D) 4

Answer: C

25) $B = \{17, \sqrt{7}, -12, 0, \frac{1}{2}, \sqrt{16}, 0.\overline{8}, 0.97\}$ Rational numbers

A) $17, 0, \sqrt{16}$ B) $17, -12, 0, \frac{1}{2}, \sqrt{16}, 0.97, 0.\overline{8}$

C) $\sqrt{7}, \frac{1}{2}, 0.97$ D) $\sqrt{7}, \sqrt{16}$

Answer: B

26) $B = \{20, \sqrt{8}, -5, 0, \frac{7}{8}, \sqrt{4}, 0.\overline{2}, 0.33\}$ Irrational numbers

A) $\sqrt{8}, \sqrt{4}, 0.\overline{2}$ B) $\sqrt{8}, \sqrt{4}, 0.33$ C) $\sqrt{8}, 0.\overline{2}$ D) $\sqrt{8}$

Answer: D

27) $B = \{15, \sqrt{7}, 0, \frac{3}{4}, \sqrt{25}, -0.\overline{9}, 0.1, -9\}$ Real numbers

A) $15, \sqrt{7}, 0, \frac{3}{4}, \sqrt{25}, 0.1$ B) $15, \sqrt{7}, \frac{3}{4}, \sqrt{25}, -0.\overline{9}, 0.1, -9$

C) $15, 0, \frac{3}{4}, -0.\overline{9}, 0.1, -9$ D) $15, \sqrt{7}, 0, \frac{3}{4}, \sqrt{25}, -0.\overline{9}, 0.1, -9$

Answer: D

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Determine whether the statement is true or false.

28) $8 > 15$

A) True B) False

Answer: B

29) $10 \geq 3$

A) True B) False

Answer: A

30) $-11 < 0$

A) False B) True

Answer: B

31) $3 < -3$

A) False B) True

Answer: A

32) $10 \leq 8$

A) False B) True

Answer: A

33) $-15 \leq 20$

A) True B) False

Answer: A

34) $21 > 6$

A) True B) False

Answer: A

35) $-18 \geq 21$

A) True B) False

Answer: B

36) $-\pi \geq -\pi$

A) True B) False

Answer: A

37) $\pi < 3$

A) True B) False

Answer: B

Rewrite the expression without absolute value bars.

38) $|16|$

A) 32 B) 0 C) -16 D) 16

Answer: D

39) $|-13|$

A) 26 B) 13 C) -13 D) 0

Answer: B

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40) $\frac{-11}{|-1|}$

A) -1 B) -11 C) 11 D) 1

Answer: B

41) $|\sqrt{5} - 19|$

A) 14 B) -14 C) $19 - \sqrt{5}$ D) $\sqrt{5} - 19$

Answer: C

42) $|7 + (-9)|$

A) 2 B) -2 C) -16 D) 16

Answer: A

43) $||-6| - |-9||$

A) 3 B) -3 C) -15 D) 15

Answer: A

44) $||-2| + |-5||$

A) 7 B) -3 C) 3 D) -7

Answer: A

Evaluate the expression for the given values of x and y.

45) $\frac{|x|}{x} + \frac{|y|}{y}$; $x = 6$ and $y = -4$

A) 1 B) 0 C) -1 D) 2

Answer: B

Express the distance between the given numbers using absolute value. Then find the distance by evaluating the absolute value expression.

46) 12 and 88

A) $-|12 + 88| = -100$ B) $-|88 - 12| = -76$ C) $|12 - 88| = 76$ D) $|12 + 88| = 100$

Answer: C

47) -60 and -5

A) $|(-5) - (-60)| = -55$ B) $|-(-60) + (-5)| = 65$ C) $|(-5) + (-60)| = -65$ D) $|(-60) - (-5)| = 55$

Answer: D

48) 54 and -1

A) $|54 + (-1)| = 53$ B) $|54 - (-1)| = 55$ C) $|(-1) - 54| = -55$ D) $|-54 + (-1)| = -53$

Answer: B

49) 38.6 and 16.6

A) $|38.6 - 16.6| = 22.0$ B) $|16.6 - 38.6| = -22.0$

C) $|-38.6 + 16.6| = -55.2$ D) $|38.6 + 16.6| = 55.2$

Answer: A

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50) –45.6 and 27.8

A) $|-45.6 + (-27.8)| = 17.8$
B) $|-45.6 - 27.8| = 73.4$
C) $|27.8 - (-45.6)| = -17.8$
D) $|27.8 + (-45.6)| = -73.4$

Answer: B

51) 20.8 and 29.6

A) $|29.6 + 20.8| = 50.4$
B) $-|20.8 + 29.6| = -50.4$
C) $|20.8 - 29.6| = 8.8$
D) $|29.6 - 20.8| = -8.8$

Answer: C

State the name of the property illustrated.

52) $9 + (-2) = (-2) + 9$

A) Identity property of addition
B) Commutative property of addition
C) Distributive property of multiplication over addition
D) Associative property of addition

Answer: B

53) $14 \cdot (6 + 2) = 14 \cdot 6 + 14 \cdot 2$

A) Distributive property of multiplication over addition
B) Associative property of multiplication
C) Commutative property of multiplication
D) Commutative property of addition

Answer: A

54) $9 + (21 + 18) = (9 + 21) + 18$

A) Identity property of addition
B) Associative property of addition
C) Distributive property of multiplication over addition
D) Commutative property of addition

Answer: B

55) $(1 + 9) + 2 = (9 + 1) + 2$

A) Inverse property of addition
B) Distributive property of multiplication over addition
C) Commutative property of addition
D) Associative property of addition

Answer: C

56) $4 \cdot (1 \cdot 13) = 4 \cdot (13 \cdot 1)$

A) Commutative property of multiplication
B) Identity property of multiplication
C) Associative property of multiplication
D) Distributive property of multiplication over addition

Answer: A

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57) $(4 + 8) + (6 + 14) = (6 + 14) + (4 + 8)$

A) Distributive property of multiplication over addition
B) Associative property of addition
C) Commutative property of addition
D) Inverse property of addition

Answer: C

58) $3 \cdot (13 \cdot 7) = (13 \cdot 7) \cdot 3$

A) Associative property of multiplication
B) Identity property of multiplication
C) Distributive property of multiplication over addition
D) Commutative property of multiplication

Answer: D

59) $(5 \cdot 18) \cdot 3 = 5 \cdot (18 \cdot 3)$

A) Commutative property of multiplication
B) Identity property of multiplication
C) Associative property of multiplication
D) Distributive property of multiplication over addition

Answer: C

60) $8(x + 3) = 8x + 8 \cdot 3$

A) Distributive property of multiplication over addition
B) Identity property of multiplication
C) Commutative property of multiplication
D) Associative property of multiplication

Answer: A

61) $5(-9 + 8) = -45 + 40$

A) Commutative property of multiplication
B) Associative property of addition
C) Distributive property of multiplication over addition
D) Associative property of multiplication

Answer: C

62) $-5(8 + 2) = -40 + (-10)$

A) Associative property of addition
B) Commutative property of multiplication
C) Associative property of multiplication
D) Distributive property of multiplication over addition

Answer: D

63) $\frac{1}{(x + 4)}(x + 4) = 1, x \neq -4$

A) Inverse property of addition
B) Identity property of multiplication
C) Commutative property of multiplication
D) Inverse property of multiplication

Answer: D

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64) $(x + 2) + [-(x + 2)] = 0$

A) Commutative property of addition
B) Identity property of multiplication
C) Inverse property of multiplication
D) Inverse property of addition

Answer: D

Simplify the algebraic expression.

65) $-9(5r + 10) + 5(4r + 9)$

A) $-4r + 1$ B) $-25r - 45$ C) $-25r + 10$ D) $-135r$

Answer: B

66) $(7z + 11) - (4z - 2)$

A) $11z + 13$ B) $3z - 13$ C) $3z + 13$ D) $3z + 9$

Answer: C

67) $-5(2x - 9) - 4x + 10$

A) $-14x - 35$ B) $14x + 55$ C) $-14x + 55$ D) $6x + 55$

Answer: C

Write the algebraic expression without parentheses.

68) $-(75y)$

A) $75y$ B) $-75y$ C) $-75 - y$ D) $75 - y$

Answer: B

69) $-9(5y)$

A) $45y$ B) $-45y$ C) $-45 - 9y$ D) $-45 + y$

Answer: B

70) $-(7x - 6)$

A) $7x - 6$ B) $-7x + 6$ C) $-7x - 6$ D) $42x$

Answer: B

71) $-(-8 + 9y)$

A) $72y$ B) $8 - 9y$ C) $8 + 9y$ D) $-8 + 9y$

Answer: B

72) $-(9z - 8w + 9y)$

A) $-9z + 8w + 9y$ B) $-9z - 8w + 9y$ C) $-9z - 8w - 9y$ D) $-9z + 8w - 9y$

Answer: D

73) $\frac{1}{4}(4x) + [(9x) + (-9x)]$

A) 1 B) x C) $-17x$ D) $19x$

Answer: B

Evaluate the exponential expression.

74) $2^3 \cdot 7$

A) 42 B) 15 C) 56 D) 2,744

Answer: C

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75) $(-4)^3$

A) –12 B) –64 C) 64 D) 12

Answer: B

76) -3^3

A) –27 B) 9 C) –9 D) 27

Answer: A

77) 5^0

A) –1 B) 5 C) 0 D) 1

Answer: D

78) $(-9)^0$

A) –1 B) 9 C) 1 D) 0

Answer: C

79) -10^0

A) 1 B) –1 C) 10 D) 0

Answer: B

80) 3^{-2}

A) $\frac{1}{9}$ B) $\frac{1}{6}$ C) 9 D) –9

Answer: A

81) $(-3)^{-4}$

A) $\frac{1}{81}$ B) 81 C) $-\frac{1}{81}$ D) –81

Answer: A

82) -2^{-3}

A) 8 B) $-\frac{1}{8}$ C) $\frac{1}{6}$ D) –8

Answer: B

83) $5^7 \cdot 5^2$

A) 5^9 B) 25^{14} C) 5^{14} D) 25^9

Answer: A

84) $(2^4)^3$

A) 48 B) 24 C) 128 D) 4,096

Answer: D

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85) $(3^4)^{-2}$

A) −24 B) −162 C) $\frac{1}{6{,}561}$ D) $\frac{1}{729}$

Answer: C

86) $5^{-3} \cdot 5$

A) $\frac{1}{25}$ B) 25 C) $\frac{1}{125}$ D) 125

Answer: A

87) $7^6 \cdot 7^{-7}$

A) −7 B) $-\frac{1}{7}$ C) $\frac{1}{7}$ D) 9.688901041e+10

Answer: C

88) $\frac{3^5}{3^4}$

A) 162 B) $\frac{5}{4}$ C) $\frac{1}{3}$ D) 3

Answer: D

Simplify the exponential expression.

89) $y \cdot y^6$

A) y^7 B) y^6 C) $2y^7$ D) $2y^6$

Answer: A

90) $x^{-8}y$

A) $-x^8y$ B) $\frac{1}{x^8y}$ C) $-\frac{y}{x^8}$ D) $\frac{y}{x^8}$

Answer: D

91) x^7y^0

A) x^7 B) $\frac{1}{x^7}$ C) 0 D) 1

Answer: A

92) $x^7 \cdot x^5$

A) 35x B) x^{35} C) 12x D) x^{12}

Answer: D

93) $x^8 \cdot x^{-6}$

A) $-\frac{1}{x^2}$ B) x^2 C) $-x^2$ D) $\frac{1}{x^2}$

Answer: B

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94) $x^{-8} \cdot x^6$

A) $-\frac{1}{x^2}$ B) x^2 C) $-x^2$ D) $\frac{1}{x^2}$

Answer: D

95) $(x^3)^5$

A) $5x^3$ B) $5x^{15}$ C) x^{15} D) x^8

Answer: C

96) $(x^{-8})^7$

A) $-8x^7$ B) $-x^{56}$ C) $-8x^{56}$ D) $\frac{1}{x^{56}}$

Answer: D

97) $(x^8)^{-5}$

A) $-x^{40}$ B) $-5x^8$ C) $\frac{1}{x^{40}}$ D) $-5x^{40}$

Answer: C

98) $(x^{-6})^{-3}$

A) $-x^9$ B) x^{18} C) $\frac{1}{x^9}$ D) $\frac{1}{x^{18}}$

Answer: B

99) $\frac{x^{15}}{x^9}$

A) x^{24} B) x^{10} C) $\frac{1}{x^6}$ D) x^6

Answer: D

100) $\frac{x^4}{x^6}$

A) x^2 B) $-\frac{1}{x^2}$ C) $\frac{1}{x^2}$ D) $-x^2$

Answer: C

101) $\frac{x^{-6}}{x^4}$

A) x^{10} B) $\frac{1}{x^2}$ C) $\frac{1}{x^{10}}$ D) $\frac{1}{x^{24}}$

Answer: C

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102) $\frac{x^{-3}}{y^{-3}}$

A) $\frac{y^3}{x^3}$ B) x^3y^3 C) $\frac{x^3}{y^3}$ D) $\frac{1}{x^3y^3}$

Answer: A

103) $(2x)^5$

A) $32x$ B) $10x^5$ C) $32x^5$ D) $10x$

Answer: C

104) $(-2x)^5$

A) $-10x^5$ B) $-10x$ C) $-32x^5$ D) $-32x$

Answer: C

105) $(6x^4)^2$

A) $6x^6$ B) $36x^4$ C) $6x^8$ D) $36x^8$

Answer: D

106) $-5y^0$

A) 0 B) 1 C) -4 D) -5

Answer: D

107) $(7b)^0$

A) b B) 1 C) 0 D) 7

Answer: B

108) $(x^8y)^2$

A) $x^{10}y^3$ B) $x^{16}y^2$ C) $x^{16}y$ D) $x^{10}y$

Answer: B

109) $(-5x^9)(9x^3)$

A) $-45x^{12}$ B) $45x^{12}$ C) $45x^{27}$ D) $-45x^{27}$

Answer: A

110) $(-9x^6y)(-2x^4y^3)$

A) $-18x^{10}y^3$ B) $18x^{10}y^4$ C) $-11x^{10}y^3$ D) $18x^{24}y^3$

Answer: B

111) $\frac{6x^9}{x^7}$

A) $36x^2$ B) $12x$ C) $6x^2$ D) $6x^{16}$

Answer: C

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112) $\frac{-40x^{11}}{5x^2}$

A) $-8x^8$ B) $-8x^9$ C) x^9 D) x^8

Answer: B

113) $\frac{-36x^4}{9x^{12}}$

A) $\frac{-4}{x^7}$ B) $-4x^8$ C) $-4x^7$ D) $\frac{-4}{x^8}$

Answer: D

114) $\left(\frac{x}{5}\right)^2$

A) $\frac{x^2}{25}$ B) $\frac{x^2}{5}$ C) $\frac{x}{5}$ D) $\frac{x^3}{125}$

Answer: A

115) $\left(-\frac{2}{x}\right)^2$

A) $\frac{4}{x}$ B) $\frac{2}{x^2}$ C) $\frac{4}{x^2}$ D) $-\frac{4}{x^2}$

Answer: C

116) $\left(\frac{x^2}{2}\right)^4$

A) $\frac{x^6}{16}$ B) $\frac{x^8}{2}$ C) $\frac{x^8}{16}$ D) $\frac{x^6}{2}$

Answer: C

117) $\left(\frac{-3x}{y}\right)^4$

A) $\frac{-12x}{y}$ B) $\frac{81x}{y^4}$ C) $\frac{-12x^4}{y^4}$ D) $\frac{81x^4}{y^4}$

Answer: D

118) $\frac{x^9y^{12}}{x^4y^2}$

A) x^4y^{10} B) x^4y^9 C) x^5y^{10} D) xy^{10}

Answer: C

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119) $\frac{-21x^{12}y^{11}}{3x^2y^4}$

A) $-7x^9y^6$ B) $-7x^{10}y^7$ C) $x^{10}y^7$ D) $-7x^9y^{10}$

Answer: B

120) x^2y^{-3}

A) y^3x^2 B) $\frac{x^2}{y^{13}}$ C) $y^{13}x^2$ D) $\frac{x^2}{y^3}$

Answer: D

121) $6x^{-6}y^2$

A) $\frac{y^2}{6x^6}$ B) $\frac{6y^2}{x^6}$ C) $\frac{6}{x^6y^2}$ D) $\frac{6x^6}{y^2}$

Answer: B

122) $\frac{x^3y^{-3}}{z^{-4}}$

A) $\frac{z^4}{x^3y^3}$ B) $\frac{x^3z^3}{y^4}$ C) $\frac{x^3z^4}{y^3}$ D) $\frac{y^3}{x^3z^4}$

Answer: C

123) $\frac{20x^8y^{10}}{5x^7y^{-5}}$

A) $4xy^5$ B) $4x^{15}y^{15}$ C) $20xy^{15}$ D) $4xy^{15}$

Answer: D

124) $\frac{-18x^{11}y^{11}z^{10}}{3x^3y^3z^9}$

A) $-6x^7y^7z$ B) $-6x^8y^8$ C) $-6x^8y^8z$ D) x^8y^8z

Answer: C

125) $\left(\frac{63x^{12}y^{12}}{7x^4y^4}\right)^0$

A) x^8y^8 B) $9x^8y^8$ C) 0 D) 1

Answer: D

126) $(-4x^4y^7)^2$

A) $16x^6y^9$ B) $-4x^8y^{14}$ C) $-16x^8y^{14}$ D) $16x^8y^{14}$

Answer: D

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127) $(3x^8)^{-2}$

A) $9x^{16}$ B) $\frac{1}{3x^{16}}$ C) $\frac{9}{x^{16}}$ D) $\frac{1}{9x^{16}}$

Answer: D

128) $(x^{-5}y^4)^{-2}-2$

A) $\frac{x^{-7}}{y^2}$ B) $\frac{1}{x^{10}y^8}$ C) $\frac{y^2}{x^{-7}}$ D) $\frac{x^{10}}{y^8}$

Answer: D

129) $(4x^{-3}y^8z^{-2})^{-1}$

A) $\frac{x^3z^2}{4y^8}$ B) $\frac{y^9}{4x^4z^3}$ C) $\frac{y^9}{-4x^4z^3}$ D) $\frac{x^3z^2}{-4y^{-8}}$

Answer: A

130) $\left(\frac{2x^2y^3}{z^2}\right)^3$

A) $\frac{8x^6y^9}{z^6}$ B) $\frac{8x^5y^6}{z^5}$ C) $\frac{2x^6y^9}{z^6}$ D) $\frac{2x^6y^9}{z^5}$

Answer: A

131) $\left(\frac{-24x^5y^7}{8x^{11}y^{-2}}\right)^3$

A) $\frac{-27y^{15}}{x^{18}}$ B) $\frac{27y^{27}}{x^{18}}$ C) $\frac{-27y^{27}}{x^{18}}$ D) $\frac{-27}{x^{18}y^{27}}$

Answer: C

132) $\left(\frac{x^{-2}}{y^4}\right)^{-1}$

A) $\frac{y^3}{x^{-3}}$ B) x^2y^4 C) $\frac{1}{x^2y^4}$ D) $\frac{x^{-3}}{y^3}$

Answer: B

133) $\left(\frac{2x^3}{y^2}\right)^{-5}$

A) $\frac{y^{10}}{32x^{15}}$ B) $\frac{32x^{15}}{y^{10}}$ C) $\frac{y^2}{32x^{15}}$ D) $\frac{32y^{10}}{x^{15}}$

Answer: A

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134) $\frac{(4x^4)^3}{x^{15}}$

A) $\frac{64}{x^{27}}$ B) $\frac{64}{x^8}$ C) $\frac{4}{x^3}$ D) $\frac{64}{x^3}$

Answer: D

135) $(-5x^5y^{-6})(3x^{-1}y)$

A) $\frac{-2x^4}{y^5}$ B) $\frac{-15x^4}{y^5}$ C) $-15x^4y^7$ D) $\frac{-15x^6}{y^7}$

Answer: B

136) $\frac{3^{-9}x^{-4}y^2}{3^{-6}x^{-7}y^4}$

A) $\frac{x^3}{27y^2}$ B) $\frac{1}{27x^7y^2}$ C) $\frac{27}{x^3y^2}$ D) $\frac{3x^3}{y^2}$

Answer: A

137) $\left(\frac{xy^5}{x^6y}\right)^{-2}$

A) $\frac{1}{x^{14}y^{12}}$ B) $\frac{x^{10}}{y^8}$ C) $\frac{1}{x^8y^{11}}$ D) $\frac{y^8}{x^{10}}$

Answer: B

138) $\left(\frac{6x^{-5}y^{-2}z^4}{2xy^{-2}z^{-4}}\right)^{-2}$

A) $\frac{3x^{12}}{z^{16}}$ B) $\frac{x^{12}}{9z^{16}}$ C) $\frac{x^8}{9z^{16}}$ D) $\frac{x^{12}y^4}{9z^{16}}$

Answer: B

Write the number in decimal notation without the use of exponents.

139) 7×10^{-2}

A) 0.07 B) 70 C) 0.7 D) 700

Answer: A

140) 7×10^{-3}

A) 7,000 B) 0.007 C) 700 D) 0.07

Answer: B

141) 6.19×10^3

A) 6,190 B) 619 C) 61,900 D) 185.7

Answer: A

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142) 2.17×10^{-4}

A) –217,000 B) 0.0000217 C) 0.000217 D) 0.00217

Answer: C

143) 4.246×10^{-6}

A) 0.0000004246 B) 0.000004246 C) –4,246,000 D) 0.00004246

Answer: B

144) -1.17×10^{6}

A) 1,170,000 B) –117,000 C) –1,170,000 D) –11,700,000

Answer: C

145) -8.5961×10^{6}

A) –8,596,100 B) –515.766 C) –859,610 D) –85,961,000

Answer: A

Write the number in scientific notation.

146) 337

A) 3.37×10^{2} B) 3.37×10^{-2} C) 3.37×10^{1} D) 3.37×10^{3}

Answer: A

147) 36,000

A) 3.6×10^{-4} B) 3.6×10^{4} C) 3.6×10^{5} D) 3.6×10^{-5}

Answer: B

148) 77,000,000

A) 7.7×10^{-7} B) 7.7×10^{6} C) 7.7×10^{-6} D) 7.7×10^{7}

Answer: D

149) 77,477

A) 7.7477×10^{5} B) 7.7477×10^{1} C) 7.7477×10^{-4} D) 7.7477×10^{4}

Answer: D

150) 0.000169

A) 1.69×10^{-4} B) 1.69×10^{-5} C) 1.69×10^{-3} D) 1.69×10^{4}

Answer: A

151) 0.00006773

A) 6.773×10^{4} B) 6.773×10^{-5} C) 6.773×10^{-4} D) 6.773×10^{5}

Answer: B

152) 0.0000000862018

A) 8.62018×10^{-7} B) 8.62018×10^{-9} C) 8.62018×10^{8} D) 8.62018×10^{-8}

Answer: D

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Perform the indicated computation. Write the answer in scientific notation.

153) $(5 \times 10^{-1})(3.2 \times 10^{7})$

A) 16×10^{7} B) 1.6×10^{7} C) 160×10^{6} D) 1.6×10^{-7}

Answer: B

154) $(3 \times 10^{9})(1.8 \times 10^{-7})$

A) 5.4×10^{3} B) 54×10^{2} C) 5.4×10^{-63} D) 5.4×10^{2}

Answer: D

155) $\dfrac{15 \times 10^{5}}{3 \times 10^{-2}}$

A) 10×10^{3} B) 5×10^{3} C) 10×10^{7} D) 5×10^{7}

Answer: D

156) $\dfrac{19.08 \times 10^{-2}}{4 \times 10^{-5}}$

A) 9.54×10^{-7} B) 4.77×10^{-7} C) 9.54×10^{3} D) 4.77×10^{3}

Answer: D

157) $\dfrac{19.32 \times 10^{-5}}{4.2 \times 10^{-4}}$

A) 9.2×10^{-1} B) 9.2×10^{-9} C) 4.6×10^{-1} D) 4.6×10^{-9}

Answer: C

158) $\dfrac{300{,}000{,}000{,}000{,}000}{0.00000005}$

A) 25×10^{20} B) 6×10^{20} C) 25×10^{21} D) 6×10^{21}

Answer: D

159) $\dfrac{0.00016 \times 0.0003}{0.0008}$

A) 48×10^{-6} B) 48×10^{6} C) 6×10^{5} D) 6×10^{-5}

Answer: D

Solve. Express the result in scientific notation. If necessary, round the decimal factor to two decimal places.

160) In a state with a population of 9,000,000 people, the average citizen spends $6,000 on housing each year. What is the total spent on housing for the state?

A) $\$5.4 \times 10^{9}$ B) $\$54 \times 10^{11}$ C) $\$5.4 \times 10^{10}$ D) $\$54 \times 10^{10}$

Answer: C

161) Approximately 4×10^{3} employees of a certain company average $30,000 each year in salary. What is the total amount earned by all the employees of this company per year?

A) $\$12 \times 10^{9}$ B) $\$1.2 \times 10^{9}$ C) $\$12 \times 10^{8}$ D) $\$1.2 \times 10^{8}$

Answer: D

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Evaluate the expression or indicate that the root is not a real number.

162) $\sqrt{4}$

A) 16 B) $\frac{1}{4}$ C) 2 D) Not a real number

Answer: C

163) $-\sqrt{361}$

A) 19 B) –19 C) –180 D) Not a real number

Answer: B

164) $\sqrt{-144}$

A) 20,736 B) $\frac{12}{144}$ C) 12 D) Not a real number

Answer: D

165) $\sqrt{64 + 36}$

A) $\sqrt{28}$ B) 10 C) 14 D) 100

Answer: B

166) $\sqrt{169 - 25}$

A) $\sqrt{119}$ B) 144 C) 17 D) 12

Answer: D

167) $\sqrt{16} + \sqrt{9}$

A) 5 B) 7 C) 25 D) $\sqrt{7}$

Answer: B

168) $\sqrt{(5)^2}$

A) $\frac{1}{25}$ B) 5 C) 625 D) Not a real number

Answer: B

169) $\sqrt{(-4)^2}$

A) 16 B) 4 C) –4 D) Not a real number

Answer: B

Use the product rule to simplify the expression.

170) $\sqrt{147}$

A) 12 B) $7\sqrt{3}$ C) 21 D) $3\sqrt{7}$

Answer: B

171) $\sqrt{10}$

A) 2 B) $5\sqrt{2}$ C) $\sqrt{10}$ D) $2\sqrt{5}$

Answer: C

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172) $\sqrt{275}$

A) $5\sqrt{11}$ B) 55 C) $\sqrt{275}$ D) $25\sqrt{11}$

Answer: A

173) $\sqrt{486x^2}$

A) $6x^2\sqrt{9}$ B) $9|x|\sqrt{6}$ C) $9\sqrt{6x}$ D) $486x$

Answer: B

174) $\sqrt{98x^2}$

A) $7x^2\sqrt{2}$ B) $7|x|\sqrt{2}$ C) $7\sqrt{2}$ D) $7\sqrt{2x^2}$

Answer: B

175) $\sqrt{9x} \cdot \sqrt{45x}$

A) $9\sqrt{5x^2}$ B) $9|x|\sqrt{5}$ C) $9\sqrt{5x}$ D) $9x^2\sqrt{5}$

Answer: B

176) $\sqrt{14x^2} \cdot \sqrt{28x}$

A) $14|x|\sqrt{2x^2}$ B) $14|x|\sqrt{2}$ C) $14x^2\sqrt{2x}$ D) $14|x|\sqrt{2x}$

Answer: D

Solve the problem.

177) Racing cyclists use the algebraic expression $4\sqrt{x}$ to determine the maximum speed, in miles per hour, to turn a corner of radius x, in feet, without tipping over. Find the maximum speed at which a cyclist should travel around a corner of radius 18 feet without tipping over. Write the answer in simplified radical form.

A) $\frac{4(4+\sqrt{2})}{x}$ miles per hour B) $16+\sqrt{2}$ miles per hour

C) $12\sqrt{2}$ miles per hour D) $16\sqrt{2}$ miles per hour

Answer: C

178) The formula $v = \sqrt{2.5r}$ models the safe maximum speed, v, in miles per hour, at which a car can travel on a curved road with radius of curvature, r, in feet. A highway crew measures the radius of curvature at an exit ramp as 360 feet. What is the maximum safe speed?

A) 36 miles per hour B) 27 miles per hour C) 30 miles per hour D) 35 miles per hour

Answer: C

179) The formula $v = \sqrt{20L}$ can be used to estimate the speed of a car, v, in miles per hour, based on the length, L, in feet, of its skid marks upon sudden braking on a dry asphalt road. If a car is involved in an accident and its skid marks measure 61.25 feet, at what estimated speed was the car traveling when it applied its brakes just prior to the accident?

A) 30 miles per hour B) 45 miles per hour C) 40 miles per hour D) 35 miles per hour

Answer: D

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180) The average height of a boy in the United States, from birth through 60 months, can be modeled by $y = 2.9\sqrt{x} + 20.1$ where y is the average height, in inches, of boys who are x months of age. What would be the expected difference in height between a child 49 months of age and a child 16 months of age?

A) 20.3 inches B) 8.7 inches C) 10.7 inches D) 48.9 inches

Answer: B

Use the quotient rule to simplify the expression.

181) $\sqrt{\frac{1}{9}}$

A) $\frac{1}{3}$ B) 9 C) 3 D) $\frac{1}{81}$

Answer: A

182) $\sqrt{\frac{4}{9}}$

A) 0 B) $\frac{\sqrt{2}}{3}$ C) $\frac{2}{3}$ D) $\frac{\sqrt{2}}{\sqrt{3}}$

Answer: C

183) $\frac{\sqrt{72x^3}}{\sqrt{2x}}$

A) $\frac{6x^2}{\sqrt{2}}$ B) $2x^2$ C) $6|x|\sqrt{2}$ D) $6|x|$

Answer: D

184) $\frac{\sqrt{144x^4}}{\sqrt{6x}}$

A) $\frac{x^2\sqrt{144}}{6}$ B) $144x^3$ C) $2|x|\sqrt{6x}$ D) $6|x|\sqrt{x}$

Answer: C

Solve the problem.

185) The time, in seconds, that it takes an object to fall a distance d, in feet, is given by the algebraic expression $\sqrt{\frac{d}{16}}$.

Find how long it will take a ball dropped from the top of a building 66 feet tall to hit the ground. Write the answer in simplified radical form.

A) $\frac{\sqrt{66}}{16}$ seconds B) $\frac{8+\sqrt{2}}{4}$ seconds C) $\frac{8\sqrt{2}}{4}$ seconds D) $\frac{\sqrt{66}}{4}$ seconds

Answer: D

Add or subtract terms whenever possible.

186) $3\sqrt{2} - 8\sqrt{2}$

A) $-24\sqrt{4}$ B) $11\sqrt{2}$ C) $-5\sqrt{4}$ D) $-5\sqrt{2}$

Answer: D

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187) $3\sqrt{3} + 9\sqrt{27}$

A) $30\sqrt{3}$ B) $24\sqrt{3}$ C) $-30\sqrt{3}$ D) $12\sqrt{3}$

Answer: A

188) $9\sqrt{5x} + 4\sqrt{5x}$

A) $36\sqrt{10x}$ B) $13\sqrt{5x}$ C) $5\sqrt{5}$ D) $13x\sqrt{10}$

Answer: B

189) $7\sqrt{3} - 5\sqrt{75}$

A) $-18\sqrt{3}$ B) $18\sqrt{3}$ C) $-32\sqrt{3}$ D) $2\sqrt{3}$

Answer: A

190) $6\sqrt{20} + 4\sqrt{80} - 3\sqrt{125}$

A) $57\sqrt{5}$ B) $6\sqrt{5}$ C) $13\sqrt{5}$ D) $-57\sqrt{5}$

Answer: C

191) $\sqrt{144} + \sqrt{147} + \sqrt{121} + \sqrt{108}$

A) $13\sqrt{3} + 23$ B) $\sqrt{147} + \sqrt{108} + 23$

C) $13\sqrt{3} + \sqrt{144} + \sqrt{121}$ D) $85\sqrt{3} + 23$

Answer: A

192) $\sqrt{2x} - 7\sqrt{32x} - 7\sqrt{50x}$

A) $-14\sqrt{2x}$ B) $-62\sqrt{2x}$ C) $-62\sqrt{84x}$ D) $-14\sqrt{84x}$

Answer: B

Rationalize the denominator.

193) $\dfrac{1}{\sqrt{2}}$

A) $\dfrac{\sqrt{2}}{2}$ B) $1 + \sqrt{2}$ C) $\dfrac{1 + \sqrt{2}}{2}$ D) $\sqrt{2}$

Answer: A

194) $\dfrac{23}{\sqrt{23}}$

A) $23\sqrt{23}$ B) 23 C) $\sqrt{23}$ D) 1

Answer: C

195) $\dfrac{\sqrt{25}}{\sqrt{7}}$

A) 54 B) $\dfrac{5\sqrt{7}}{7}$ C) $5\sqrt{7}$ D) $\dfrac{25\sqrt{7}}{7}$

Answer: B

196) $\frac{\sqrt{4}}{\sqrt{3}}$

A) $\frac{4\sqrt{3}}{3}$ B) $2\sqrt{3}$ C) 11 D) $\frac{2\sqrt{3}}{3}$

Answer: D

197) $\frac{\sqrt{5}}{\sqrt{3}}$

A) $\sqrt{5}$ B) $\frac{\sqrt{15}}{3}$ C) $\frac{\sqrt{15}}{9}$ D) $\sqrt{15}$

Answer: B

198) $\frac{7}{8-\sqrt{6}}$

A) $\frac{7}{8}-\frac{7}{\sqrt{6}}$ B) $\frac{56-7\sqrt{6}}{58}$ C) $\frac{56+7\sqrt{6}}{58}$ D) $\frac{56+7\sqrt{6}}{2}$

Answer: C

199) $\frac{\sqrt{6}}{\sqrt{17}+2}$

A) $\frac{3\sqrt{102}+17\sqrt{34}}{6}$ B) $\frac{\sqrt{102}-2\sqrt{6}}{19}$ C) $\frac{\sqrt{102}-2\sqrt{6}}{13}$ D) $\frac{\sqrt{102}+2\sqrt{6}}{13}$

Answer: C

200) $\frac{3}{7-\sqrt{2}}$

A) $\frac{21+3\sqrt{2}}{5}$ B) $\frac{21+3\sqrt{2}}{47}$ C) $\frac{3}{7}-\frac{3}{\sqrt{2}}$ D) $\frac{21-3\sqrt{2}}{47}$

Answer: B

201) $\frac{2}{\sqrt{5}+\sqrt{7}}$

A) $\sqrt{5}-\sqrt{7}$ B) $\sqrt{7}+\sqrt{5}$ C) $\sqrt{2}$ D) $\sqrt{7}-\sqrt{5}$

Answer: D

Evaluate the radical expressions or indicate that the root is not a real number.

202) $\sqrt[3]{-27}$

A) –27 B) 3 C) –3 D) not a real number

Answer: C

203) $\sqrt[3]{(4)^3}$

A) 64 B) 4 C) –4 D) not a real number

Answer: B

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204) $\sqrt[4]{10{,}000}$

A) 10 B) 10,000 C) −10 D) not a real number

Answer: A

205) $\sqrt[4]{(-5)^4}$

A) −5 B) 625 C) 5 D) not a real number

Answer: C

Simplify the radical expression.

206) $\sqrt[3]{x^4}$

A) $x^2\sqrt[3]{x}$ B) $x\sqrt[3]{x^2}$ C) $x^2\sqrt[3]{x^2}$ D) $x\sqrt[3]{x}$

Answer: D

207) $\sqrt[3]{10} \cdot \sqrt[3]{4}$

A) $\sqrt[3]{40}$ B) $2\sqrt[3]{10}$ C) $\sqrt[6]{40}$ D) $2\sqrt[3]{5}$

Answer: D

Add or subtract terms whenever possible.

208) $5\sqrt[3]{40} + \sqrt[3]{135}$

A) $6\sqrt[3]{175}$ B) $5\sqrt[3]{175}$ C) $8\sqrt[3]{5}$ D) $13\sqrt[3]{5}$

Answer: D

209) $y\sqrt[3]{54x} - \sqrt[3]{250xy^3}$

A) $-2y\sqrt[3]{2x}$ B) $(y + 1)\sqrt[3]{255}$ C) $y\sqrt[3]{-245xy^3}$ D) $3y\sqrt[3]{2x} - 54\sqrt[3]{2xy^3}$

Answer: A

Evaluate the expression without using a calculator.

210) $121^{1/2}$

A) 44 B) 22 C) 5.5 D) 11

Answer: D

211) $81^{1/4}$

A) 243 B) 36 C) 3 D) 12

Answer: C

212) $27^{4/3}$

A) 81 B) 2,187 C) 729 D) 243

Answer: A

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213) $36^{-3/2}$

A) -216 B) $\frac{1}{216}$ C) $-\frac{1}{216}$ D) 216

Answer: B

Simplify using properties of exponents.

214) $(10x^{1/4})(7x^{3/2})$

A) $70x^{7/4}$ B) $70x^{1/2}$ C) $70x^{1/4}$ D) $70x^{7/3}$

Answer: A

215) $\frac{28x^{3/4}}{4x^{1/3}}$

A) $24x^{1/6}$ B) $7x^{1/6}$ C) $7x^{5/12}$ D) $7x^{5/4}$

Answer: C

216) $(81x^8y^4)^{1/2}$

A) $9x^4y^2$ B) $81x^4y^2$ C) $6{,}561x^{16}y^4$ D) $\frac{9}{2}x^4y^2$

Answer: A

Simplify by reducing the index of the radical.

217) $\sqrt[12]{x^9}$

A) $\sqrt[3]{x^3}$ B) $\sqrt[4]{x}$ C) $\sqrt[4]{x^3}$ D) $\sqrt[3]{x}$

Answer: C

218) $\sqrt[12]{27x^3}$

A) $\sqrt[4]{3x}$ B) $3\sqrt[4]{3x}$ C) $\frac{1}{81x}$ D) $\sqrt[3]{3x}$

Answer: A

Solve the problem.

219) The algebraic expression $0.07d^{3/2}$ describes the duration of a storm, in hours, whose diameter is d miles. Use a calculator to determine the duration of a storm with a diameter of 5 miles. Round to the nearest hundredth.

A) 0.21 hours B) 0.78 hours C) 0.16 hours D) 11.18 hours

Answer: B

Is the algebraic expression a polynomial? If it is, write the polynomial in standard form.

220) $4x^{-1} - 7 + 7x$

A) No B) Yes; $7x + 4x^{-1} - 7$

Answer: A

221) $8x - 1 + 2x^2$

A) No B) Yes; $2x^2 + 8x - 1$

Answer: B

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222) $\frac{3x - 5}{x}$

A) Yes; $\frac{5}{x} - 3$ B) No

Answer: B

223) $x^2 - x^3 + x^4 + 8$

A) Yes; $x^4 - x^3 + x^2 + 8$ B) No

Answer: A

Find the degree of the polynomial.

224) $-3x + 15x^7 - 3$

A) degree 15 B) degree 8 C) degree –3 D) degree 7

Answer: D

225) $-5x + 3x^7 + 7x^6 - 20$

A) degree 4 B) degree 6 C) degree 3 D) degree 7

Answer: D

226) $-15x^4 - 8x^3 - 3x + 2x^5 + 5$

A) degree 4 B) degree 3 C) degree –15 D) degree 5

Answer: D

227) $x^5 - 9x^3y^7 + 11xy - 8x + 4$

A) degree 5 B) degree 10 C) degree 17 D) degree –9

Answer: B

Perform the indicated operations. Write the resulting polynomial in standard form.

228) $(5x^6 - 5x^3 - 3x) + (8x^6 + 8x^3 - 3x)$

A) $13x^6 + 3x^3 - 6x$ B) $10x^{10}$ C) $13x + 3x^6 - 6x^3$ D) $5x^6 + 13x^3 - 8x$

Answer: A

229) $(6x^4 + 5x^3 - 3x^2 - 5) + (6x^4 + 7x^3 - 3x^2 - 2)$

A) $18x^{18} - 7$ B) $12x^8 + 12x^6 - 6x^4 - 7$

C) $2x^4 + 2x^3 + 4x^2 + 11$ D) $12x^4 + 12x^3 - 6x^2 - 7$

Answer: D

230) $(-7x^5 - 19x^4 - 11) + (3x^5 - 5x^4 + 4)$

A) $-4x^5 - 24x^4 + 15$ B) $-35x^9$ C) $-4x^5 - 24x^4 - 7$ D) $-4x^5 + 2x^4 + 15$

Answer: C

231) $(-2x^7 - 5x^6 - 6x^5 - 6) + (5x^7 - 3x^6 - 9x^5 + 4)$

A) $3x^7 - 8x^6 - 15x^5 - 2$ B) $3x^7 + 2x^6 - 3x^5 + 10$

C) $7x^7 + 2x^6 - 3x^5 + 10$ D) $7x^7 + 2x^6 - 3x^5 - 2$

Answer: A

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232) $(6x^7 + 8x^5 + 12) - (3x^7 - 19x^5 - 7)$

A) $3x^7 + 27x^5 + 5$ B) $3x^7 + 27x^5 + 19$ C) $49x^{12}$ D) $3x^7 + 11x^5 + 5$

Answer: B

233) $(6x^9 + 5x^8 - 3x^7 + 3) - (3x^9 - 3x^8 + 8x^7 - 5)$

A) $3x^9 + 8x^8 - 11x^7 + 8$ B) $9x^9 + 2x^8 + 5x^7 + 8$

C) $9x^9 + 2x^8 + 5x^7 - 2$ D) $3x^9 + 2x^8 + 5x^7 - 2$

Answer: A

234) $(5x^6 - 13x^5 - 7) - (3x^6 - 5x^5 + 5)$

A) $2x^6 - 8x^5 - 2$ B) $-18x^{11}$ C) $2x^6 - 8x^5 - 12$ D) $2x^6 - 10x^5 - 2$

Answer: C

235) $(3x^2 + 4x + 7) + (2x^2 + 4x + 4) - (5x + 2)$

A) $5x^2 + 3x + 13$ B) $5x^2 + 3x + 9$ C) $3x^2 + 3x + 13$ D) $3x^2 + 3x + 9$

Answer: B

Find the product.

236) $(x + 3)(x^2 - 3x + 9)$

A) $x^3 + 27$ B) $x^3 - 6x^2 - 6x + 27$ C) $x^3 - 27$ D) $x^3 + 6x^2 + 6x + 27$

Answer: A

237) $(x - 12)(x^2 + 6x - 5)$

A) $x^3 + 18x^2 + 77x + 60$ B) $x^3 - 6x^2 - 67x - 60$ C) $x^3 - 6x^2 - 77x + 60$ D) $x^3 + 18x^2 + 67x - 60$

Answer: C

238) $(x + 9)(x^2 + 6x - 7)$

A) $x^3 + 15x^2 + 47x - 63$ B) $x^3 + 15x^2 + 61x + 63$

C) $x^3 + 15x^2 + 61x - 63$ D) $x^4 + 9x^3 + 6x^2 + 47x - 63$

Answer: A

239) $(x + 9)(5x^2 + 6x + 4)$

A) $50x^3 + 60x^2 + 40x$ B) $5x^3 + 51x^2 + 58x + 36$

C) $270x^4 + 5x^3 + 216x^2 + 36$ D) $5x^3 + 45x^2 + 54x + 36$

Answer: B

240) $(7x - 1)(x^2 - 2x + 1)$

A) $7x^3 + 15x^2 - 9x + 1$ B) $7x^3 - 14x^2 + 7x + 1$ C) $7x^3 - 15x^2 + 9x - 1$ D) $7x^3 - 13x^2 + 5x - 1$

Answer: C

241) $(x - 8)(x + 1)$

A) $x^2 - 8x - 8$ B) $x^2 - 7x - 7$ C) $x^2 - 7x - 8$ D) $x^2 - 8x - 7$

Answer: C

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242) $(3x - 8)(x + 11)$

A) $x^2 - 88x + 25$ B) $3x^2 + 25x - 88$ C) $x^2 + 25x + 24$ D) $3x^2 + 24x - 88$

Answer: B

243) $(3x + 8)(8x - 7)$

A) $24x^2 + 43x + 43$ B) $11x^2 + 43x + 43$ C) $11x^2 + 43x - 56$ D) $24x^2 + 43x - 56$

Answer: D

244) $(7x^2 - 5)(5x^2 + 8)$

A) $35x^2 + 31x - 40$ B) $12x^4 + 31x^2 - 40$ C) $35x^4 + 31x^2 + 31$ D) $35x^4 + 31x^2 - 40$

Answer: D

245) $(7x^3 - 4)(x^2 + 4)$

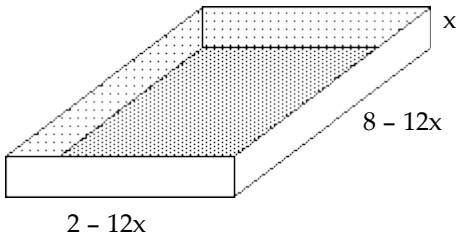
A) $7x^6 + 28x^3 - 4x^2 - 16$ B) $7x^5 + 24x^2 - 16$

C) $7x^5 + 24x^3 - 16$ D) $7x^5 + 28x^3 - 4x^2 - 16$

Answer: D

Solve the problem.

246) Write a polynomial in standard form that represents the volume of the open box.

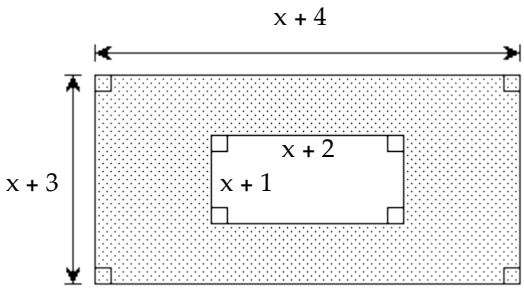


A) $144x^3 - 120x^2 + 16x$ B) $144x^2 - 120x + 16$

C) $144x^3 + 120x^2 + 16x$ D) $12x^3 - 120x^2 + 16x$

Answer: A

247) Write a polynomial in standard form that represents the area of the shaded region.



A) $4x + 10$ B) $-4x - 10$ C) $10x + 14$ D) $x^2 + 9x + 10$

Answer: A

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Find the product.

248) $(x + 10)(x - 10)$

A) $x^2 - 20x - 100$ B) $x^2 - 100$ C) $x^2 - 20$ D) $x^2 + 20x - 100$

Answer: B

249) $(5x + 4)(5x - 4)$

A) $25x^2 - 16$ B) $25x^2 + 40x - 16$ C) $x^2 - 16$ D) $25x^2 - 40x - 16$

Answer: A

250) $(3 + 8x)(3 - 8x)$

A) $64x^2 - 9$ B) $9 - 48x - 64x^2$ C) $9 + 48x - 64x^2$ D) $9 - 64x^2$

Answer: D

251) $(5x^2 + 4x)(5x^2 - 4x)$

A) $25x^4 - 40x^3 - 16x^2$ B) $25x^4 - 16x^2$ C) $10x^4 - 8x^2$ D) $25x^4 + 40x^3 - 16x^2$

Answer: B

252) $(1 + x^5)(1 - x^5)$

A) $2 - x^{10}$ B) $1 - x^{25}$ C) $1 - x^{10}$ D) $2 - x^{25}$

Answer: C

253) $(9 - y^4)(9 + y^4)$

A) $y^8 - 81$ B) $81 - y^{16}$ C) $81 - y^4$ D) $81 - y^8$

Answer: D

254) $(x + 14)^2$

A) $x + 196$ B) $x^2 + 196$ C) $196x^2 + 28x + 196$ D) $x^2 + 28x + 196$

Answer: D

255) $(x - 7)^2$

A) $x^2 - 14x + 49$ B) $49x^2 - 14x + 49$ C) $x^2 + 49$ D) $x + 49$

Answer: A

256) $(8x + 7)^2$

A) $8x^2 + 112x + 49$ B) $64x^2 + 49$ C) $8x^2 + 49$ D) $64x^2 + 112x + 49$

Answer: D

257) $(9x - 11)^2$

A) $9x^2 + 121$ B) $81x^2 + 121$ C) $81x^2 - 198x + 121$ D) $9x^2 - 198x + 121$

Answer: C

258) $(8x^2 + 5)^2$

A) $64x^4 + 80x^2 + 25$ B) $8x^4 + 80x^2 + 25$ C) $64x^2 + 80x + 25$ D) $64x^4 + 25$

Answer: A

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259) $(5x^2 - 3)^2$

A) $25x^2 - 30x + 9$ B) $25x^4 - 30x^2 + 9$ C) $25x^4 + 30x^2 + 9$ D) $25x^4 - 30x^2 - 9$

Answer: B

260) $(7 + 9x)^2$

A) $49 + 126x + 81x^2$ B) $49x^2 + 126x + 81$ C) $49 + 81x^2$ D) $49 + 126x + 9x^2$

Answer: A

261) $(9 - 10x)^2$

A) $81 + 100x^2$ B) $81 - 180x + 100x^2$ C) $81 - 180x - 100x^2$ D) $81x^2 - 180x + 100$

Answer: B

262) $(x - 4)^3$

A) $x^3 - 4x^2 + 24x - 64$ B) $x^3 - 12x^2 + 24x - 64$ C) $x^3 - 12x^2 + 48x - 64$ D) $x^3 - 12x^2 + 12x - 64$

Answer: C

263) $(5x + 4)^3$

A) $25x^2 + 40x + 16$ B) $25x^6 + 20x^3 + 4{,}096$

C) $125x^3 + 300x^2 + 240x + 64$ D) $125x^3 + 300x^2 + 300x + 64$

Answer: C

264) $(3x - 2)^3$

A) $9x^2 - 12x + 4$ B) $27x^3 + 54x^2 + 36x + 8$

C) $27x^3 - 54x^2 + 54x - 8$ D) $27x^3 - 54x^2 + 36x - 8$

Answer: D

Perform the indicated operations.

265) $(-3x^2y - xy) + (8x^2y + 6xy)$

A) $5x^2y + 7xy$ B) $5x^2y + 5xy$ C) $11x^2y + 7xy$ D) $11x^2y + 5xy$

Answer: B

266) $(9x^2y - 4xy + 6) + (-8x^2y + 10xy - 3)$

A) $17x^2y + 14xy + 9$ B) $6x^3y^2 + 3$ C) $-x^2y - 14xy + 9$ D) $x^2y + 6xy + 3$

Answer: D

267) $(11x^4y^2 - 9x^2y^2 + 6xy) + (3x^4y^2 - 10x^2y^2 + 12xy)$

A) $14x^4y^2 + 19x^2y^2 + 18xy$ B) $19x^4y^2 - 14x^2y^2 + 18xy$

C) $-19x^4y^2 + 14x^2y^2 + 18xy$ D) $14x^4y^2 - 19x^2y^2 + 18xy$

Answer: D

268) $(x^3 + 7xy - 4y^2) - (6x^3 + 4xy + y^2)$

A) $-5x^3 + 3xy - 3y^2$ B) $-5x^3 + 3xy - 5y^2$ C) $7x^3 + 3xy - 5y^2$ D) $5x^3 - 3xy - 3y^2$

Answer: B

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269) $(5x^4 + 3xy - y^3) - (x^4 + 9xy + 3y^3)$

A) $4x^4 - 6xy - 2y^3$ B) $6x^4 + 16xy + 2y^3$ C) $5x^4 - 6xy - 4y^3$ D) $4x^4 - 6xy - 4y^3$

Answer: D

270) $(10x^4y^2 + 6x^3y + 7y) - (4x^4y^2 + 12x^3y + 11y + 2x)$

A) $6x^4y^2 + 6x^3y - 4y - 2x$ B) $14x^4y^2 + 18x^3y + 18y + 2x$

C) $6x^4y^2 - 6x^3y - 4y + 2x$ D) $6x^4y^2 - 6x^3y - 4y - 2x$

Answer: D

Find the product.

271) $(x + 10y)(x + 10y)$

A) $x^2 + 17xy + 100y^2$ B) $x^2 + 20xy + 100y^2$ C) $x + 20xy + 100y$ D) $x^2 + 20xy + 20y^2$

Answer: B

272) $(x - 9y)(3x + 11y)$

A) $3x^2 - 16xy - 16y^2$ B) $3x^2 - 16xy - 99y^2$ C) $x^2 - 16xy - 99y^2$ D) $x^2 - 16xy - 16y^2$

Answer: B

273) $(5xy + 6)(2xy + 9)$

A) $7x^2y^2 + 57xy + 54$ B) $10x^2y^2 + 57xy + 57$ C) $7x^2y^2 + 57xy + 57$ D) $10x^2y^2 + 57xy + 54$

Answer: D

274) $(9x + 4y)^2$

A) $81x^2 + 16y^2$ B) $9x^2 + 72xy + 16y^2$ C) $81x^2 + 72xy + 16y^2$ D) $9x^2 + 16y^2$

Answer: C

275) $(7x - 9y)^2$

A) $49x^2 + 81y^2$ B) $7x^2 + 81y^2$

C) $49x^2 - 126xy + 81y^2$ D) $7x^2 - 126xy + 81y^2$

Answer: C

276) $(m - n)(m^2 + mn + n^2)$

A) $m^3 + n^3$ B) $m^3 - 2m^2n - 2mn^2 - n^3$

C) $m^3 - n^3$ D) $m^3 + 2m^2n + 2mn^2 - n^3$

Answer: C

277) $(x^2y^2 + 2)^2$

A) $x^4y^4 + 2x^2y^2 + 4$ B) $x^4y^4 + 4x^2y^2 + 4$ C) $x^4y^4 + 4$ D) $x^2y^2 + 4xy + 4$

Answer: B

278) $(4x + 13y)(4x - 13y)$

A) $16x^2 - 104xy - 169y^2$ B) $16x^2 - 169y^2$

C) $4x^2 - 13y^2$ D) $16x^2 + 104xy - 169y^2$

Answer: B

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279) $(5xy^2 - 12y)(5xy^2 + 12y)$

A) $25x^2y^4 - 120xy^3 - 144y^2$ B) $25x^2y^4 + 120xy^3 - 144y^2$

C) $25x^2y^4 - 144y^2$ D) $5x^2y^4 - 12y^2$

Answer: C

Factor out the greatest common factor.

280) $4x + 20$

A) $4(x + 20)$ B) $4(x + 5)$ C) $4x(5)$ D) $4x(x + 5)$

Answer: B

281) $4x^2 - 28x$

A) $4(x^2 - 7x)$ B) $4x(x - 7x)$ C) $4x(x - 7)$ D) $x(4x - 28)$

Answer: C

282) $21x^4 - 9x^3 + 12x^2$

A) $x^2(21x^2 - 9x + 12)$ B) $3x^2(7x^2 - 3x + 4)$ C) $3x(7x^3 - 3x^2 + 4x)$ D) $3(7x^4 - 3x^3 + 4x^2)$

Answer: B

283) $x(x + 3) + 5(x + 3)$

A) $(x + 3)(x + 5)$ B) $3x(x + 5)$ C) $5x(x + 3)$ D) $(x^2 + 3x) + (5x + 15)$

Answer: A

284) $x(5x - 6) + 2(5x - 6)$

A) $2x(5x - 6)$ B) $(5x - 6)(x + 2)$ C) $(5x - 6)(x - 2)$ D) $(5x + 2)(x - 6)$

Answer: B

285) $x^2(x - 6) - (x - 6)$

A) $(x^3 - 6x^2) - (x - 6)$ B) $x^2(x - 6)$ C) $(x - 6)(x^2 + 1)$ D) $(x - 6)(x^2 - 1)$

Answer: D

Factor by grouping. Assume any variable exponents represent whole numbers.

286) $x^3 - 3x^2 + 2x - 6$

A) $(x - 3)(x + 2)$ B) $(x + 2)(x^2 - 3)$ C) $(x - 3)(x^2 + 2)$ D) $(x + 3)(x^2 - 2)$

Answer: C

287) $x^3 + 9x + 5x^2 + 45$

A) $(x + 5)(x + 9)$ B) $(x - 5)(x^2 + 9)$ C) $(x + 5)(x^2 + 9)$ D) $(x + 5)(x^2 - 9)$

Answer: C

288) $3x^3 + 6x^2 + 7x + 14$

A) $(x - 2)(3x^2 + 7)$ B) $(x + 2)(3x^2 - 7)$ C) $(x + 2)(3x + 7)$ D) $(x + 2)(3x^2 + 7)$

Answer: D

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Factor the trinomial, or state that the trinomial is prime.

289) $x^2 + 15x + 54$

A) $(x - 9)(x + 6)$ B) $(x - 9)(x + 1)$ C) $(x + 9)(x + 6)$ D) prime

Answer: C

290) $x^2 + 11x + 24$

A) $(x - 3)(x + 8)$ B) $(x - 3)(x + 1)$ C) $(x + 3)(x + 8)$ D) prime

Answer: C

291) $x^2 - 4x - 45$

A) $(x - 5)(x + 1)$ B) $(x + 5)(x - 9)$ C) $(x - 5)(x - 9)$ D) prime

Answer: B

292) $x^2 + 6x - 40$

A) $(x + 10)(x - 4)$ B) $(x - 10)(x + 1)$ C) $(x - 10)(x + 4)$ D) prime

Answer: A

293) $x^2 - x - 56$

A) $(x + 1)(x - 15)$ B) $(x + 8)(x - 7)$ C) $(x + 7)(x - 8)$ D) prime

Answer: C

294) $x^2 - x - 54$

A) $(x + 6)(x - 9)$ B) $(x - 6)(x + 9)$ C) $(x - 54)(x + 1)$ D) prime

Answer: D

295) $5x^2 + 47x + 18$

A) $(5x + 2)(x + 9)$ B) $(5x + 2)(5x + 9)$ C) $(5x + 9)(x + 2)$ D) prime

Answer: A

296) $3x^2 - 23x + 14$

A) $(3x - 2)(x - 7)$ B) $(3x - 2)(3x + 7)$ C) $(3x + 7)(x - 2)$ D) $3(x - 2)(x - 7)$

Answer: A

297) $7x^2 - 16x - 15$

A) $(7x - 5)(x + 3)$ B) $(7x + 5)(x - 3)$ C) $(7x - 3)(x + 5)$ D) prime

Answer: B

298) $7x^2 - 23x + 20$

A) $(7x - 5)(x + 4)$ B) $(7x + 5)(x - 4)$ C) $(7x - 4)(x + 5)$ D) prime

Answer: D

299) $20x^2 + 31x + 12$

A) $(4x - 3)(5x - 4)$ B) $(20x + 3)(x + 4)$ C) $(4x + 3)(5x + 4)$ D) prime

Answer: C

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300) $20x^2 - 23x + 6$

A) $(5x + 2)(4x + 3)$ B) $(20x + 2)(x + 3)$ C) $(5x - 2)(4x - 3)$ D) prime

Answer: C

301) $15x^2 + 11x - 12$

A) $(15x + 4)(x - 3)$ B) $(3x + 4)(5x - 3)$ C) $(3x - 4)(5x + 3)$ D) prime

Answer: B

302) $x^2 - 11xy + 24y^2$

A) $(x + 3y)(x + y)$ B) $(x + 3y)(x - 8y)$ C) $(x - 3y)(x - 8y)$ D) prime

Answer: C

303) $7x^2 + 8xy + y^2$

A) $(7x - y)(x - y)$ B) $(7x + y)(x + 7y)$ C) $(7x + y)(x + y)$ D) prime

Answer: C

304) $2x^2 + 3xy - 27y^2$

A) $y(2x + 9)(x - 3)$ B) $(2x + 9y)(x - 3y)$ C) $(2x + 3y)(x - 9y)$ D) prime

Answer: B

305) $9x^2 + 6xy - 8y^2$

A) $(3x + 2y)(3x - 4y)$ B) $(3x - 2y)(3x + 4y)$ C) $(9x - 2y)(x + 4y)$ D) prime

Answer: B

Factor the difference of two squares.

306) $x^2 - 4$

A) $(x + 2)^2$ B) $(x + 2)(x - 2)$ C) $(x - 2)^2$ D) prime

Answer: B

307) $9x^2 - 49$

A) $(3x - 7)^2$ B) $(3x + 7)(3x - 7)$ C) $(3x + 7)^2$ D) prime

Answer: B

308) $49x^2 - 169y^2$

A) $(7x - 13y)^2$ B) $(7x + 13y)(7x - 13y)$ C) $(7x + 13y)^2$ D) prime

Answer: B

309) $x^4 - 81$

A) $(x^2 + 9)(x + 3)(x - 3)$ B) $(x^2 - 9)(x^2 - 9)$

C) $(x^2 + 9)(x^2 + 9)$ D) prime

Answer: A

310) $(16x^4 - 81)$

A) $(4x^2 + 9)(2x + 3)(2x - 3)$ B) $(4x^2 + 9)(4x^2 + 9)$

C) $(4x^2 + 9)(4x^2 - 9)$ D) $(2x + 3)^2(2x - 3)^2$

Answer: A

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Factor the perfect square trinomial.

311) $x^2 - 18x + 81$

A) $(x + 9)^2$ B) $(x - 9)^2$ C) $(x - 9)(x + 9)$ D) prime

Answer: B

312) $x^2 - 15x + 225$

A) $(x + 15)^2$ B) $(x + 15)(x - 15)$ C) $(x - 15)^2$ D) prime

Answer: D

313) $36x^2 + 12x + 1$

A) $(6x + 1)^2$ B) $(x + 6)^2$ C) $(6x + 1)(6x - 1)$ D) prime

Answer: A

Factor using the formula for the sum or difference of two cubes.

314) $x^3 - 27$

A) $(x + 27)(x^2 - 1)$ B) $(x + 3)(x^2 - 3x + 9)$

C) $(x - 3)(x^2 + 3x + 9)$ D) prime

Answer: C

315) $x^3 + 64$

A) $(x + 4)(x^2 + 16)$ B) $(x - 4)(x^2 + 4x + 16)$

C) $(x + 4)(x^2 - 4x + 16)$ D) prime

Answer: C

316) $8x^3 - 1$

A) $(2x - 1)(4x^2 + 2x + 1)$ B) $(2x + 1)(4x^2 - 2x + 1)$

C) $(2x - 1)(4x^2 + 1)$ D) prime

Answer: A

317) $8x^3 + 1$

A) $(2x - 1)(4x^2 + 1)$ B) $(2x + 1)(4x^2 - 2x + 1)$

C) $(2x - 1)(4x^2 + 2x + 1)$ D) prime

Answer: B

318) $27x^3 + 8$

A) $(3x - 2)(9x^2 + 6x + 4)$ B) $(3x + 2)(9x^2 + 4)$

C) $(3x + 2)(9x^2 - 6x + 4)$ D) $(3x + 2)(9x^2 + 6x + 4)$

Answer: C

319) $125x^3 - 27$

A) $(5x - 3)(25x^2 + 15x + 9)$ B) $(5x - 3)(25x^2 + 9)$

C) $(5x - 3)(25x^2 - 15x + 9)$ D) $(5x + 3)(25x^2 - 15x + 9)$

Answer: A

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Factor completely, or state that the polynomial is prime.

320) $11x^3 - 44x$

A) $11(x + 2)(x^2 - 2x)$ B) $11x(x + 2)(x - 2)$ C) $x(x + 2)(11x - 22)$ D) prime

Answer: B

321) $12x^2 - 147$

A) $3(2x + 7)^2$ B) prime C) $3(2x - 7)^2$ D) $3(2x + 7)(2x - 7)$

Answer: D

322) $4x^2 - 24x - 108$

A) $(x - 9)(4x + 12)$ B) $4(x - 9)(x + 3)$ C) $4(x^2 - 6x - 27)$ D) $(4x - 36)(x + 3)$

Answer: B

323) $4x^4 - 4$

A) $4(x^2 + 1)(x^2 - 1)$ B) $4(x^2 + 1)(x + 1)(x - 1)$

C) $4(x + 1)^2(x - 1)^2$ D) prime

Answer: B

324) $x^3 - 6x^2 - 25x + 150$

A) $(x + 6)(x + 5)(x - 5)$ B) $(x - 6)(x - 5)^2$ C) $(x - 6)(x + 5)(x - 5)$ D) prime

Answer: C

325) $5x^2 - 5x - 30$

A) $5(x - 2)(x + 3)$ B) $5(x + 2)(x - 3)$ C) prime D) $(5x + 10)(x - 3)$

Answer: B

326) $x^3 - 16x$

A) $x(x - 4)^2$ B) $(x^2 + 4)(x - 4)$ C) $x(x + 4)(x - 4)$ D) prime

Answer: C

327) $25x^3 - 25x$

A) $x(x + 5)(x - 5)$ B) $25x(x^2 + 1)$ C) $25x(x^2 - 1)$ D) $25x(x + 1)(x - 1)$

Answer: D

328) $x^2 + 100$

A) $(x - 10)^2$ B) $(x + 10)^2$ C) $(x + 10)(x - 10)$ D) prime

Answer: D

329) $4x^3 - 4$

A) $4(x + 1)(x^2 - x + 1)$ B) $4(x^3 - 1)$ C) $4(x - 1)(x^2 + x + 1)$ D) prime

Answer: C

330) $2x^3 + 16$

A) $2(x^3 + 8)$ B) $2(x + 2)^3$ C) $2(x + 2)(x^2 - 2x + 4)$ D) prime

Answer: C

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331) $y^5 - 256y$

A) $y(y^2 + 16)(y + 4)(y - 4)$ B) $y(y^2 - 16)(y^2 - 16)$

C) $y(y^2 + 16)(y^2 + 16)$ D) prime

Answer: A

332) $4x^5 - 4x$

A) $4x(x^4 + 1)(x^2 + 1)(x + 1)(x - 1)$ B) $4x(x^2 + 1)(x^2 - 1)$

C) $4x(x^2 + 1)(x + 1)(x - 1)$ D) prime

Answer: C

333) $108y^4 - 75y^2$

A) $3y^2(6y - 5)^2$ B) $3(6y^2 + 5)(6y^2 - 5)$ C) $3y^2(6y + 5)(6y - 5)$ D) prime

Answer: C

334) $16x^2 - 56x + 49 - 25y^2$

A) $(4x - 7 + 5y)(4x - 7 - 5y)$ B) $(4x + 7 + 5y)(4x - 7 - 5y)$

C) $(4x + 7 + 5y)(4x + 7 - 5y)$ D) prime

Answer: A

335) $81b^2x - 16y - 16x + 81b^2y$

A) $(9bx + 4y)(9bx - 4y)$ B) $(9bx - 4y)^2$

C) $(9b + 4)(9b - 4)(x + y)$ D) prime

Answer: C

336) $x^2y - 36y + 144 - 4x^2$

A) $(y - 4)(x^2 + 36)$ B) $(y - 4)(x + 6)(x - 6)$ C) $(y + 4)(x + 6)(x - 6)$ D) prime

Answer: B

337) $2x^3 - 50a^2x - 16x^2 + 32x$

A) $2x(x - 4 + 5a)(x + 4 - 5a)$ B) $2x(x - 4 + 5a)(x + 4 + 5a)$

C) $2x(x - 4 + 5a)(x - 4 - 5a)$ D) prime

Answer: C

Solve the problem.

338) A department store is having a clearance sale. The price on a television is reduced by 38%. That sale price is then reduced by another 38%. If x is the television's original price, the sale price can be represented by $(x - 0.38x) - 0.38(x - 0.38x)$. With these two reductions, at what percentage of the original price is the television being sold? Use the factored, simplified form of the expression to answer the question.

A) 24% B) 76% C) 38.44% D) 62%

Answer: C

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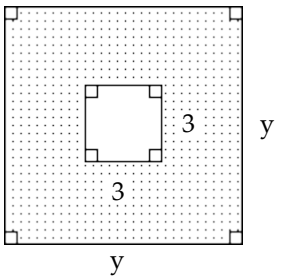
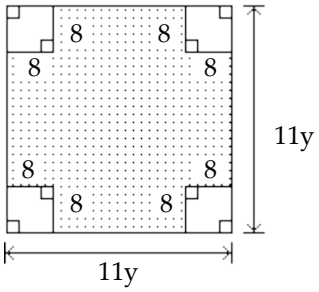
339) Write an expression for the area of the shaded region and express it in factored form.



A) $y^2 + 9$ B) $(y + 3)^2$ C) $(y - 3)^2$ D) $(y + 3)(y - 3)$

Answer: D

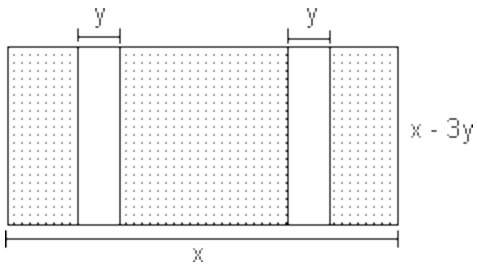
340) Write an expression for the area of the shaded region and express it in factored form.



A) $(11y - 8)^2$ B) $(11y - 16)^2$ C) $(11y + 16)(11y - 16)$ D) $(11y + 8)(11y - 8)$

Answer: C

341) Write an expression for the area of the shaded region and express it in factored form.



A) $(x - y)(x - 3y)$ B) $5(x - y)^2$ C) $(x - 5y)^2$ D) $(x - 2y)(x - 3y)$

Answer: D

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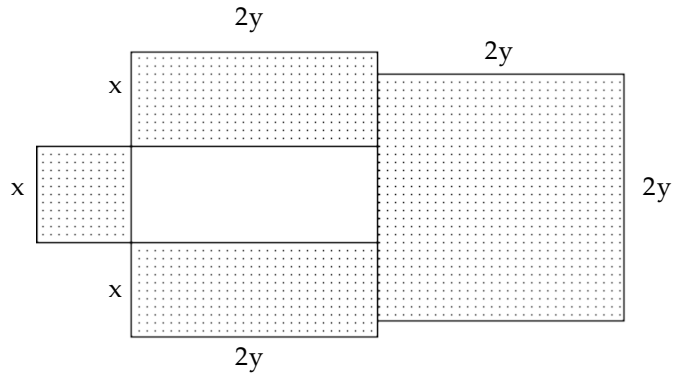
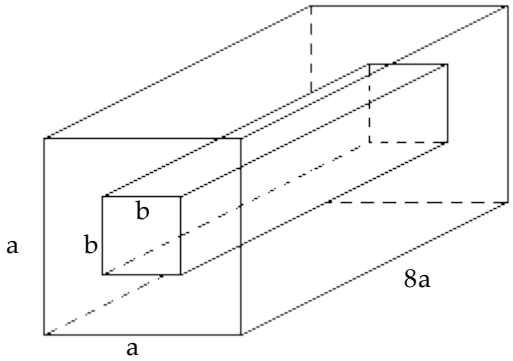
342) Write an expression for the area of the shaded region and express it in factored form.



A) $2(x + y)^2$ B) $x^2 + 2xy + 4y^2$ C) $(x + 2y)^2$ D) $x^2 + 4xy + 4y^2$

Answer: C

343) Find the formula for the volume of the region outside the smaller rectangular solid and inside the larger rectangular solid. Express the volume in factored form.



A) $8a(a^2 - b^2)$ B) $(8a + b)(8a - b)$ C) $8a(a + b)(a - b)$ D) $8a(a^2 + b^2)$

Answer: C

Factor and simplify the algebraic expression.

344) $x^{6/7} - x^{1/7}$

A) $x^{6/7}(1 - x^{5/7})$ B) $x^{1/7}(x^6 - 1)$ C) $x^{1/7}(x^{5/7} - 1)$ D) $x(x^{5/7} - 1)$

Answer: C

345) $7x^{-4/5} + 28x^{1/5}$

A) $\dfrac{1 + 4x^{1/5}}{7x^{4/5}}$ B) $\dfrac{1 + 7x}{4x^{4/5}}$ C) $\dfrac{4 + x}{7x^{1/5}}$ D) $\dfrac{7(4x + 1)}{x^{4/5}}$

Answer: D

346) $(x + 5)^{1/4} + (x + 5)^{3/4}$

A) $(x + 5)^{1/2}((x + 5)^{1/2} + 1)$ B) $(x + 5)^{1/2}(1 + (x + 5)^{1/4})$

C) $(x + 5)^{1/4}(1 + (x + 5)^{1/2})$ D) $(x + 5)^{1/2}(1 + (x + 5)^{3/2})$

Answer: C

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347) $(x + 8)^{2/5} - (x + 8)^{12/5}$

A) $(x + 8)^{2/5}(-x^2 - 16x - 63)$ B) $(x + 8)(-x^2 - 16x + 63)$

C) $(x + 8)((x + 8)^{2/5} - (x + 8)^{12/5})$ D) $(x + 8)^{12/5}((x + 8)^{1/6} - 1)$

Answer: A

348) $(x + 9)^{-1/5} + (x + 9)^{-6/5}$

A) $(x + 9)^{-1/5} + (x + 9)^{-6/5}$ B) $(x + 9)^{6/5}(x + 10)$

C) $\dfrac{(x + 10)}{(x+ 9)^{1/5}}$ D) $\dfrac{(x + 10)}{(x+ 9)^{6/5}}$

Answer: D

349) $(x + 7)^{-1/3} - (x + 7)^{-2/3}$

A) $\dfrac{(x+ 7)^{1/3} - 1}{(x+ 7)^{1/3}}$ B) $\dfrac{x + 6}{(x+ 7)^{2/3}}$

C) $(x + 7)^{-1/3} - (x + 7)^{-2/3}$ D) $\dfrac{(x+ 7)^{1/3} - 1}{(x+ 7)^{2/3}}$

Answer: D

Find all numbers that must be excluded from the domain of the rational expression.

350) $\dfrac{5}{x - 2}$

A) $x \neq 2$ B) $x \neq -5$ C) $x \neq -2$ D) $x \neq 0$

Answer: A

351) $\dfrac{5}{x + 4}$

A) $x \neq 0$ B) $x \neq -5$ C) $x \neq -4$ D) $x \neq 4$

Answer: C

352) $\dfrac{x + 2}{x^2 - 81}$

A) $x \neq -2$ B) $x \neq 9$ C) $x \neq 9, x \neq -9$ D) $x \neq 81$

Answer: C

353) $\dfrac{x - 9}{x^2 - 36}$

A) $x \neq \dfrac{1}{4}$ B) $x \neq 6$ C) $x \neq 6, x \neq -6$ D) $x \neq 36$

Answer: C

354) $\dfrac{x - 7}{x^2 + 9x + 14}$

A) $x \neq 0$ B) $x \neq -7, x \neq -2$ C) $x \neq 7$ D) $x \neq 7, x \neq 2$

Answer: B

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355) $\frac{x - 2}{x^2 - 3x - 10}$

A) $x \neq -5, x \neq 2$ B) $x \neq 0$ C) $x \neq -2, x \neq 5$ D) $x \neq 2$

Answer: C

356) $\frac{x + 7}{x^2 - 12x + 35}$

A) $x \neq -7$ B) $x \neq -5, x \neq -7$ C) $x \neq 0$ D) $x \neq 5, x \neq 7$

Answer: D

Simplify the rational expression. Find all numbers that must be excluded from the domain of the simplified rational expression.

357) $\frac{4x + 3}{20x^2 + 23x + 6}$

A) $\frac{1}{5x + 2}, x \neq -\frac{2}{5}, x \neq -\frac{3}{4}$ B) $\frac{4x}{5x + 2}, x \neq -\frac{2}{5}$

C) $\frac{4x + 3}{20x^2 + 23x + 6}, x \neq -\frac{2}{5}, x \neq -\frac{3}{4}$ D) $\frac{4x + 5}{5x + 23}, x \neq -\frac{23}{5}$

Answer: A

358) $\frac{x^2 + 12x + 35}{x^2 + 13x + 42}$

A) $\frac{12x + 5}{13x + 6}, x \neq -\frac{6}{13}$ B) $-\frac{x^2 + 12x + 35}{x^2 + 13x + 42}, x \neq -6, -7$

C) $\frac{12x + 35}{13x + 42}, x \neq -\frac{42}{13}$ D) $\frac{x + 5}{x + 6}, x \neq -6, -7$

Answer: D

359) $\frac{7x^2 - 31x + 12}{x - 4}$

A) $\frac{7x^2 - 31x + 12}{x - 4}, x \neq 4$ B) $\frac{1}{x - 4}, x \neq 4$

C) $7x - 3, x \neq 4$ D) $7x^2 - 34$, no restrictions on x

Answer: C

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Provide an appropriate response.

360) The rational expression $\frac{120x}{100-x}$ describes the cost, in millions of dollars, to inoculate x percent of the current population of cattle against a particular virus. Choose which of the following statements are true with regard to this mathematical model.

I. The expression will be undefined when $x = 100$.
II. The cost of inoculating 90 percent of cattle is 900 million dollars more than the cost of inoculating 60 percent of cattle.
III. This expression will calculate inoculation costs for any population of cattle, no matter what the size.

A) Only I and III are true.
B) All three statements are true.
C) Only I and II are true.
D) Only II and III are true.

Answer: C

Multiply or divide as indicated.

361) $\frac{3x}{6x+3} \cdot \frac{4x+2}{3}$

A) $\frac{2}{3}$
B) $\frac{2x}{9}$
C) $\frac{x}{3}$
D) $\frac{2x}{3}$

Answer: D

362) $\frac{5x-5}{x} \cdot \frac{6x^2}{7x-7}$

A) $\frac{30x^3-30x^2}{7x^2-7x}$
B) $\frac{30x}{7}$
C) $\frac{7}{30x}$
D) $\frac{35x^2+70x+35}{6x^3}$

Answer: B

363) $\frac{6x-2}{2x+14} \cdot \frac{x+7}{12x-4}$

A) $\frac{1}{4}$
B) $\frac{1}{2}$
C) 4
D) $\frac{x+7}{4(x-7)}$

Answer: A

364) $\frac{x^3+1}{x^3-x^2+x} \cdot \frac{10x}{-120x-120}$

A) $-\frac{x^2+1}{12}$
B) $-\frac{x^3+1}{12(x+1)}$
C) $\frac{x+1}{12(-x-1)}$
D) $-\frac{1}{12}$

Answer: D

365) $\frac{x^2-7x+12}{x^2+x-12} \cdot \frac{x^2-9}{x^2-x-12}$

A) $\frac{x-4}{x+3}$
B) $\frac{x+3}{x-4}$
C) $\frac{x+3}{x+4}$
D) $\frac{x-3}{x+4}$

Answer: D

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366) $\frac{x^2 + 15x + 56}{x^2 + 16x + 64} \cdot \frac{x^2 + 8x}{x^2 + 3x - 28}$

A) $\frac{1}{x - 4}$ B) $\frac{x}{x - 4}$ C) $\frac{x(x + 8)}{x - 4}$ D) $\frac{x}{x^2 + 16x + 64}$

Answer: B

367) $\frac{x^2 + 11x + 28}{x^2 + 13x + 42} \cdot \frac{x^2 + 6x}{x^2 + 7x + 12}$

A) $\frac{x^2 + 6x}{x + 3}$ B) $\frac{1}{x + 3}$ C) $\frac{x}{x + 3}$ D) $\frac{x}{x^2 + 13x + 42}$

Answer: C

368) $\frac{x^2 + 5x + 6}{x^2 + 7x + 12} \cdot \frac{x^2 + 7x + 12}{x^2 + 5x + 6}$

A) $\frac{x + 2}{x + 4}$ B) $\frac{x + 4}{x + 3}$ C) 1 D) $\frac{1}{x + 3}$

Answer: C

369) $\frac{x^2 - 14x + 40}{x^2 - 18x + 72} \cdot \frac{x^2 - 8x + 12}{x^2 - 11x + 28}$

A) $\frac{(x - 10)}{(x - 7)}$

B) $\frac{(x^2 - 14x + 40)(x^2 - 8x + 12)}{(x^2 - 18x + 72)(x^2 - 11x + 28)}$

C) $\frac{(x + 10)(x + 2)}{(x + 12)(x + 7)}$

D) $\frac{(x - 10)(x - 2)}{(x - 12)(x - 7)}$

Answer: D

370) $\frac{5x + 15}{8} \div \frac{4x + 12}{12}$

A) $\frac{9x + 27}{20}$ B) $\frac{5x + 15}{32x}$ C) $\frac{15}{8}$ D) $\frac{5}{24}$

Answer: C

371) $\frac{33x - 33}{9} \div \frac{11x - 11}{63}$

A) $\frac{7(33x - 33)}{11x - 11}$ B) $\frac{363(x - 1)^2}{567}$ C) $\frac{1}{21}$ D) 21

Answer: D

372) $\frac{(y - 9)^2}{4} \div \frac{4y - 36}{16}$

A) $y - 9$ B) $\frac{(y - 9)^3}{16}$ C) $\frac{4(y - 9)^2}{4y - 36}$ D) $\frac{1}{y - 9}$

Answer: A

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373) $\frac{1}{x+6} \div \frac{5}{x^2-36}$

A) $\frac{x-6}{5}$ B) $x-6$ C) $\frac{5}{x-6}$ D) $\frac{x+6}{5}$

Answer: A

374) $\frac{(x+7)^2}{x-7} \div \frac{x^2-49}{7x-49}$

A) $\frac{(x+7)^3}{7(x-7)}$ B) $\frac{7(x+7)}{x-7}$ C) $\frac{(x+7)^2}{(x-7)^2}$ D) $\frac{14(x^2+49)}{x^2-49}$

Answer: B

375) $\frac{x^2-12x+36}{7x-42} \div \frac{12x-72}{84}$

A) 84 B) $\frac{x^2-12x+36}{(x-6)^2}$ C) 1 D) $\frac{(x-6)^2}{49}$

Answer: C

376) $\frac{x^2+10x+21}{x^2+11x+24} \div \frac{x^2+7x}{x^2+15x+56}$

A) $\frac{x+7}{x^2+8x}$ B) $\frac{x}{x^2+11x+24}$ C) $x+7$ D) $\frac{x+7}{x}$

Answer: D

377) $\frac{x^2+8x+12}{x^2+11x+18} \div \frac{x^2+6x}{x^2+2x-63}$

A) $x-7$ B) $\frac{x-7}{x^2+9x}$ C) $\frac{x-7}{x}$ D) $\frac{x}{x^2+11x+18}$

Answer: C

378) $\frac{3x^2+14x-49}{8x-32} \cdot \frac{x^2-4x}{9x^2-49} \div \frac{7x+49}{3x^3}$

A) $\frac{3x^3}{56(3x+7)}$ B) $\frac{3x^4}{56(3x+7)}$ C) $\frac{7(x+7)^2}{24x^2(3x+7)}$ D) $\frac{56}{3x^4(3x+7)}$

Answer: B

Add or subtract as indicated.

379) $\frac{6x+3}{7x+8} + \frac{8x+13}{7x+8}$

A) $\frac{2}{7x+8}$ B) 2 C) $\frac{8x+9}{7x+8}$ D) 1

Answer: B

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380) $\frac{x^2 - 10x}{x^2 + 4x} + \frac{x^2 + x}{x^2 + 4x}$

A) $\frac{2x - 9}{x + 4}$ B) $\frac{-9}{x + 4}$ C) $\frac{2x + 9}{x + 4}$ D) $\frac{x - 9}{x + 4}$

Answer: A

381) $\frac{x^2 - 9x}{x - 4} + \frac{20}{x - 4}$

A) $\frac{x^2 - 9x + 20}{x - 4}$ B) $x - 5$ C) $x - 4$ D) $x + 5$

Answer: B

382) $\frac{9x + 4}{x^2 + 9x + 18} + \frac{2 - 8x}{x^2 + 9x + 18}$

A) $\frac{1}{x + 3}$ B) $\frac{1}{x + 6}$ C) $\frac{x - 6}{x^2 + 9x + 18}$ D) $\frac{1}{x^2 + 9x + 18}$

Answer: A

383) $\frac{x^2 - 12}{x^2 + 3x - 18} + \frac{3x - 6}{x^2 + 3x - 18}$

A) $\frac{x - 3}{x^2 + 3x - 18}$ B) $\frac{(x - 6)(x + 3)}{(x + 6)(x - 3)}$ C) $\frac{x - 3}{x - 3}$ D) $\frac{x + 6}{x - 3}$

Answer: C

384) $\frac{6x}{x - 8} - \frac{48}{x - 8}$

A) 6 B) $\frac{6x - 48}{x - 16}$ C) $6x$ D) $\frac{1}{6}$

Answer: A

385) $\frac{x - 8}{x - 2} - \frac{2x + 6}{x - 2}$

A) $\frac{x - 14}{x - 2}$ B) $\frac{x + 14}{x - 2}$ C) $-\frac{x - 14}{x - 2}$ D) $-\frac{x + 14}{x - 2}$

Answer: D

386) $\frac{2x}{x^2 - 7x + 10} - \frac{10}{x^2 - 7x + 10}$

A) $\frac{2}{x - 5}$ B) $\frac{2}{x - 2}$ C) $\frac{2(x - 5)}{(x + 5)(x - 2)}$ D) $\frac{2(x + 5)}{(x - 5)(x - 2)}$

Answer: B

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387) $\frac{8x - 10}{x^2 - 11x + 18} - \frac{7x - 8}{x^2 - 11x + 18}$

A) $\frac{1}{x^2 - 11x + 18}$ B) $\frac{1}{x - 9}$ C) $\frac{1}{x - 2}$ D) $\frac{x + 2}{x^2 - 11x + 18}$

Answer: B

388) $\frac{3}{x} + \frac{7}{x - 4}$

A) $\frac{10x - 12}{x(4 - x)}$ B) $\frac{12x - 10}{x(4 - x)}$ C) $\frac{10x - 12}{x(x - 4)}$ D) $\frac{12x - 10}{x(x - 4)}$

Answer: C

389) $\frac{5}{x + 3} - \frac{2}{x - 3}$

A) $\frac{3x - 21}{(x + 3)(x - 3)}$ B) $\frac{3}{(x + 3)(x - 3)}$ C) $\frac{3x - 9}{(x + 3)(x - 3)}$ D) $\frac{3x + 21}{(x + 3)(x - 3)}$

Answer: A

390) $\frac{5}{x - 8} + \frac{25}{8 - x}$

A) $\frac{30}{x - 8}$ B) $-\frac{30}{x - 8}$ C) $\frac{20}{x - 8}$ D) $-\frac{20}{x - 8}$

Answer: D

391) $\frac{11}{x - 4} - \frac{3}{4 - x}$

A) $\frac{8}{x - 4}$ B) $\frac{14}{4 - x}$ C) $\frac{56 - 14x}{(x - 4)(4 - x)}$ D) $\frac{14}{x - 4}$

Answer: D

392) $\frac{4}{x^2 - 3x + 2} + \frac{5}{x^2 - 1}$

A) $\frac{40x - 6}{(x - 1)(x + 1)(x - 2)}$ B) $\frac{6x - 9}{(x - 1)(x + 1)(x - 2)}$ C) $\frac{9x - 6}{(x - 1)(x - 2)}$ D) $\frac{9x - 6}{(x - 1)(x + 1)(x - 2)}$

Answer: D

393) $\frac{x}{x^2 - 16} - \frac{5}{x^2 + 5x + 4}$

A) $\frac{x^2 - 4}{(x - 4)(x + 4)(x + 1)}$ B) $\frac{x^2 - 4x + 20}{(x - 4)(x + 4)(x + 1)}$ C) $\frac{x^2 - 4x + 20}{(x - 4)(x + 4)}$ D) $\frac{x^2 + 4x + 20}{(x - 4)(x + 4)(x + 1)}$

Answer: B

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394) $\frac{x+3}{x^2+3x-40}+\frac{3x+5}{x^2+6x-16}$

A) $\frac{4x^2-9x-31}{(x+8)(x-5)(x-2)}$ B) $4x+8$ C) $\frac{4x+8}{2x^2+9x-56}$ D) $\frac{4x^2-9x-31}{(x-8)(x+5)(x+2)}$

Answer: A

395) $\frac{6x}{x+1}+\frac{7}{x-1}-\frac{12}{x^2-1}$

A) $\frac{x+1}{x-1}$ B) $\frac{6x-5}{x+1}$ C) $\frac{6x}{x-1}$ D) $\frac{6x-5}{x-1}$

Answer: D

Solve the problem.

396) Doctors use the rational expression

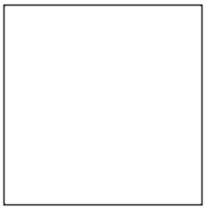
$$\frac{DA}{A+12}$$

to determine the dosage of a drug prescribed for children. In this expression, A = child's age and D = adult dosage. What is the difference in the child's dosage for a 12–year–old child and an 8–year–old child? Express the answer as a single rational expression in terms of D.

A) $\frac{1}{5}D$ B) $27D$ C) $\frac{1}{10}D$ D) $\frac{1}{6}D$

Answer: C

397) Express the perimeter of the square as a single rational expression.



$\frac{11}{x+4}$

A) $\frac{44}{x+16}$ B) $\frac{11}{x+16}$ C) $\frac{44}{x+4}$ D) $\frac{44}{x+8}$

Answer: C

398) Express the perimeter of the rectangle as a single rational expression.

$\frac{9}{x-6}$

$\frac{4}{x}$

A) $\frac{13x-24}{x(x-6)}$ B) $\frac{26x-48}{x(6-x)}$ C) $\frac{26x-48}{x(x-6)}$ D) $\frac{13x-24}{x(6-x)}$

Answer: C

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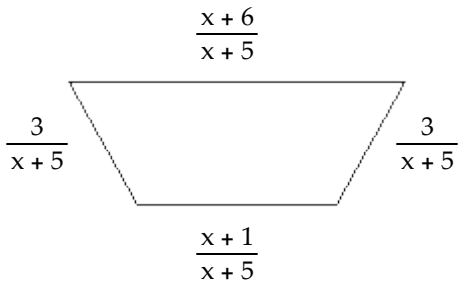
399) Express the perimeter of the trapezoid as a single rational expression.



A) $\frac{4x+13}{x+5}$ B) $\frac{x+13}{x+5}$ C) $x+8$ D) $\frac{2x+13}{x+5}$

Answer: D

Simplify the complex rational expression.

400) $\frac{\frac{x}{10}-1}{x-10}$

A) -10 B) $x-10$ C) $\frac{10}{x-10}$ D) $\frac{1}{10}$

Answer: D

401) $\frac{1-\frac{2}{x}}{1+\frac{2}{x}}$

A) $x+2$ B) $\frac{x+2}{x-2}$ C) $\frac{x-2}{x+2}$ D) $x-2$

Answer: C

402) $\frac{\frac{7}{x}+1}{\frac{7}{x}-1}$

A) $\frac{7+x}{7-x}$ B) 7 C) $\frac{x^2}{x^2+7}$ D) x^2+7

Answer: A

403) $\frac{1-\frac{1}{x}}{2+\frac{1}{x}}$

A) $\frac{x-1}{2x}$ B) $\frac{x-1}{2x+1}$ C) $\frac{2x+1}{x-1}$ D) $\frac{x+1}{2x-1}$

Answer: B

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404) $\dfrac{9+\dfrac{3}{x}}{\dfrac{x}{4}+\dfrac{1}{12}}$

A) $\dfrac{x}{36}$ B) 1 C) 36 D) $\dfrac{36}{x}$

Answer: D

405) $\dfrac{x-\dfrac{x}{x+6}}{x+5}$

A) $\dfrac{x}{x+5}$ B) $\dfrac{x^2}{x+6}$ C) $\dfrac{x}{x+6}$ D) $\dfrac{x}{x-6}$

Answer: C

406) $\dfrac{\dfrac{x}{x+4}+1}{\dfrac{12}{x^2-16}+1}$

A) $\dfrac{2x-8}{x-2}$ B) $\dfrac{2x+8}{x+2}$ C) $\dfrac{x-4}{x-2}$ D) $\dfrac{2x-8}{x+2}$

Answer: A

407) $\dfrac{\dfrac{10}{9x-1}-10}{\dfrac{10}{9x-1}+10}$

A) $\dfrac{2-x}{x}$ B) $\dfrac{2-9x}{9x}$ C) $\dfrac{9x}{2-9x}$ D) $\dfrac{2+9x}{9x}$

Answer: B

408) $\dfrac{\dfrac{1}{x+2}}{\dfrac{3}{x^2-4}}$

A) $\dfrac{3}{x-2}$ B) $\dfrac{x-2}{3}$ C) $x-2$ D) $\dfrac{x+2}{3}$

Answer: B

409) $\dfrac{\dfrac{36y^2 - 64x^2}{xy}}{\dfrac{6}{x} - \dfrac{8}{y}}$

A) $\dfrac{xy}{6x + 8y}$ B) $\dfrac{8x + 6y}{xy}$ C) $8x + 6y$ D) $6x + 8y$

Answer: C

410) $\dfrac{\dfrac{3}{x^2 - 3x - 18} - \dfrac{1}{x - 6}}{\dfrac{1}{x + 3} + 1}$

A) -1 B) $-\dfrac{x}{x^2 - 2x - 24}$ C) $-\dfrac{x}{x^2 - 3x - 18}$ D) $\dfrac{x}{x^2 - 4x - 24}$

Answer: B

Solve the problem.

411) The average speed on a round-trip commute having a one-way distance d is given by the complex rational expression

$$\frac{2d}{\dfrac{d}{r_1} + \dfrac{d}{r_2}},$$

in which r_1 and r_2 are the speeds on the outgoing and return trips, respectively. Fred and Michael both drove to campus averaging 40 miles per hour and each returned home on the same route he used going and averaged 45 miles per hour. Fred's one-way route was 6 miles longer than Michael's. Simplify the complex rational expression and answer the question: How does Fred's overall average speed compare with Michael's?

A) Fred's average speed is the same as Michael's.
B) Fred's average speed is lower than Michael's.
C) Fred's average speed is higher than Michael's.
D) Not enough information is given to answer the question.

Answer: A

Simplify the expression.

412) $\dfrac{\sqrt{x} - \dfrac{1}{3\sqrt{x}}}{\sqrt{x}}$

A) $1 - \dfrac{1}{3}$ B) $1 - \dfrac{1}{3x}$ C) $x^2 - \dfrac{1}{3x}$ D) $\dfrac{\sqrt{x} - \dfrac{1}{3\sqrt{x}}}{\sqrt{x}}$

Answer: B

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413) $\dfrac{\dfrac{x^2}{\sqrt{x^2+7}} - \sqrt{x^2+7}}{x^2}$

A) $\dfrac{\dfrac{x^2}{\sqrt{x^2+7}} - \sqrt{x^2+7}}{x^2}$ B) $\dfrac{-7}{x^2\sqrt{x^2+7}}$ C) $\dfrac{7}{x^2\sqrt{x^2+7}}$ D) $\dfrac{2x^2+7}{x^2\sqrt{x^2+7}}$

Answer: B

414) $\dfrac{\sqrt{4-x^2} + \dfrac{x^2}{\sqrt{4-x^2}}}{4-x^2}$

A) $\dfrac{\sqrt{4-x^2} + \dfrac{x^2}{\sqrt{4-x^2}}}{4-x^2}$ B) $\dfrac{1+x^2}{(4-x^2)^{3/2}}$ C) $\dfrac{4+2x^2}{(4-x^2)^{3/2}}$ D) $\dfrac{4}{(4-x^2)^{3/2}}$

Answer: D

415) $\dfrac{\dfrac{1}{\sqrt{x+3}} - \dfrac{1}{\sqrt{x}}}{3}$

A) $\dfrac{\sqrt{3}}{3\sqrt{x}\sqrt{x+3}}$ B) $\dfrac{1}{3\sqrt{x+3}} - \dfrac{1}{3\sqrt{x}}$ C) $\dfrac{1}{3}$ D) $\dfrac{\dfrac{1}{\sqrt{x+3}} - \dfrac{1}{\sqrt{x}}}{3}$

Answer: B

Rationalize the numerator.

416) $\dfrac{\sqrt{x+8} - \sqrt{x}}{8}$

A) $\dfrac{\sqrt{x+8} - \sqrt{x}}{8}$ B) $\dfrac{\sqrt{x+8} + \sqrt{x}}{8}$ C) $\dfrac{1}{\sqrt{x+8} + \sqrt{x}}$ D) $\dfrac{2\sqrt{x+8}}{8\sqrt{x+8} + \sqrt{x}}$

Answer: C

417) $\dfrac{\sqrt{x} - \sqrt{y}}{x^2 - y^2}$

A) $\dfrac{1}{(x+y)(\sqrt{x} - \sqrt{y})}$ B) $\dfrac{x^2 - y^2}{x^2 + y^2}$ C) $\dfrac{1}{(x+y)(\sqrt{x} + \sqrt{y})}$ D) $\dfrac{1}{x+y}$

Answer: C

Solve the linear equation.

418) $8x - 6 = 74$

A) {72} B) {76} C) {15} D) {10}

Answer: D

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419) $8x - (6x - 1) = 2$

A) $\left\{-\frac{1}{14}\right\}$ B) $\left\{\frac{1}{2}\right\}$ C) $\left\{\frac{1}{14}\right\}$ D) $\left\{-\frac{1}{2}\right\}$

Answer: B

420) $10a + 2 = 9a + 8$

A) {–6} B) {10} C) {–10} D) {6}

Answer: D

421) $27t - 3 = 7t + 13$

A) $\left\{\frac{4}{5}\right\}$ B) $\{17\}$ C) $\left\{\frac{27}{10}\right\}$ D) $\left\{-\frac{4}{5}\right\}$

Answer: A

422) $7x - 8 = 5 - 4x$

A) $\left\{-\frac{11}{13}\right\}$ B) $\{-1\}$ C) $\left\{\frac{11}{13}\right\}$ D) $\left\{\frac{13}{11}\right\}$

Answer: D

423) $2x - 7 = 3(x + 2)$

A) {–1} B) {–13} C) {1} D) {13}

Answer: B

424) $5(x + 4) + 7 = 4(x + 5) + 6$

A) {13} B) {9} C) {–1} D) {17}

Answer: C

425) $-18 - (3y + 2) = 2(y + 2) + 3y$

A) $\{-12\}$ B) $\left\{-\frac{9}{4}\right\}$ C) $\left\{-\frac{1}{3}\right\}$ D) {–3}

Answer: D

426) $8y + 4(1 + y) = 3(y - 8) + 10y$

A) {28} B) {9} C) {–9} D) {–28}

Answer: A

427) $(-3x - 9) - 2 = -2(x + 6)$

A) {17} B) {– 1} C) {– 5} D) {1}

Answer: D

428) $6x - 6 + 7(x + 1) = 6x - 5$

A) $\{-1\}$ B) $\left\{-\frac{6}{7}\right\}$ C) $\{-3\}$ D) $\left\{-\frac{18}{7}\right\}$

Answer: B

429) $-6[6x + 5 + 4(x + 1)] = -5x - 1$

A) $\left\{\frac{53}{6}\right\}$ B) $\left\{-\frac{7}{6}\right\}$ C) $\left\{\frac{7}{55}\right\}$ D) $\left\{-\frac{53}{55}\right\}$

Answer: D

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430) $\frac{x}{6} = \frac{x}{9} + 8$

A) {72} B) {54} C) {48} D) $\{144\}$

Answer: D

431) $\frac{x}{3} = \frac{x}{2} + \frac{7}{3}$

A) $\{-14\}$ B) 0 C) $\left\{-\frac{7}{3}\right\}$ D) $\left\{-\frac{1}{14}\right\}$

Answer: A

432) $\frac{x}{18} + \frac{2}{9} = \frac{x+4}{9}$

A) {–4} B) {0} C) {–2} D) {–6}

Answer: A

433) $\frac{x+3}{6} - 1 = \frac{x-3}{5}$

A) $\{3\}$ B) $\{32\}$ C) $\left\{\frac{3}{11}\right\}$ D) $\{-33\}$

Answer: A

434) $55 - \frac{x}{4} = \frac{x}{7}$

A) $\left\{\frac{605}{28}\right\}$ B) $\left\{\frac{605}{2}\right\}$ C) {140} D) {5}

Answer: C

435) $\frac{2x}{5} = \frac{x}{3} + 3$

A) {–90} B) {–45} C) {45} D) {90}

Answer: C

436) $\frac{8x}{9} - x = \frac{x}{63} - \frac{4}{7}$

A) $\left\{\frac{9}{2}\right\}$ B) $\left\{-\frac{9}{2}\right\}$ C) $\{6\}$ D) $\{-6\}$

Answer: A

437) $\frac{x+8}{3} = \frac{14}{5} - \frac{x-2}{5}$

A) $\{18\}$ B) {42} C) {1} D) {0}

Answer: C

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438) $\frac{x+16}{8}+\frac{x+8}{8}=x+8$

A) $\left\{-\frac{44}{3}\right\}$ B) $\{-12\}$ C) $\left\{-\frac{28}{3}\right\}$ D) $\left\{-\frac{20}{3}\right\}$

Answer: D

First, write the value or values of the variable that make a denominator zero. Then solve the equation.

439) $\frac{6}{x}=\frac{1}{2x}+55$

A) 0; $\left\{\frac{1}{10}\right\}$ B) 0, 2; $\left\{\frac{13}{22}\right\}$ C) none; {5} D) 0; {10}

Answer: A

440) $\frac{2}{x}+8=\frac{5}{2x}+\frac{16}{3}$

A) 0, 2, 3; $\left\{\frac{3}{16}\right\}$ B) none; $\left\{\frac{16}{3}\right\}$ C) 0; $\left\{\frac{16}{3}\right\}$ D) 0; $\left\{\frac{3}{16}\right\}$

Answer: D

441) $\frac{x-9}{3x}+7=\frac{x+5}{x}$

A) 0; $\left\{-\frac{17}{2}\right\}$ B) 0, 3; $\left\{\frac{24}{19}\right\}$ C) none; $\left\{\frac{2}{3}\right\}$ D) 0; $\left\{\frac{24}{19}\right\}$

Answer: D

442) $\frac{6}{x-3}+3=\frac{12}{x-3}$

A) –3; {5} B) –3; {9} C) 3; ∅ D) 3; {5}

Answer: D

443) $\frac{20}{4x-4}+\frac{1}{4}=\frac{5}{x-1}$

A) 4; {1} B) –1, 4; {1, 4} C) 1; {1} D) 1; ∅

Answer: D

444) $\frac{1}{x+2}+\frac{3}{x-2}=\frac{12}{(x+2)(x-2)}$

A) –2, 2; ∅ B) none; {2} C) –2; {2} D) –2, 2; {3}

Answer: A

Solve the rational equation.

445) $\frac{x}{x-8}-6=\frac{8}{x-8}$

A) {–8, 8} B) {–8} C) {8} D) ∅

Answer: D

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446) $\frac{4}{x-1}+\frac{4}{2x-2}=6$

A) {2} B) {0} C) {1} D) {24}

Answer: A

447) $\frac{2}{x-5}+\frac{8}{5-x}=\frac{8}{x+3}$

A) $\left\{\frac{11}{7}\right\}$ B) $\left\{\frac{11}{9}\right\}$ C) $\left\{-\frac{11}{7}\right\}$ D) $\{5\}$

Answer: A

448) $\frac{x}{2x+2}=\frac{2x-3}{x+1}-\frac{2x}{4x+4}$

A) $\left\{\frac{3}{2}\right\}$ B) $\left\{-\frac{12}{5}\right\}$ C) {–3} D) {3}

Answer: D

449) $\frac{9}{y+3}-\frac{7}{y-3}=\frac{8}{y^2-9}$

A) {28} B) $\{\sqrt{64}\}$ C) {–28} D) {56}

Answer: A

450) $\frac{1}{x+5}+\frac{3}{x+4}=\frac{-1}{x^2+9x+20}$

A) {–5} B) ∅ C) {0} D) {4}

Answer: B

451) $\frac{m+3}{m^2+9m+20}-\frac{3}{m^2+8m+16}=\frac{m-3}{m^2+9m+20}$

A) {3} B) {–3} C) {–9} D) {18}

Answer: B

Solve the problem.

452) The formula $C=\frac{28{,}000+260x}{x}$ models the average cost per unit, C, for Electrostuff to manufacture x units of Electrogadget IV. How many units must the company produce to have an average cost per unit of $390?

A) 108 units B) 215 units C) 217 units D) 200 units

Answer: B

453) Suppose a cost–benefit model is given by $y=\frac{2{,}571x}{100-x}$, where y is the cost for removing x percent of a given pollutant. What percent of pollutant can be removed for $40,000?

A) 106.9% B) 94.0% C) 608.7% D) 9.4%

Answer: B

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454) The U.S. Maritime Administration estimated that the cost per ton of building an oil tanker could be represented by the model $y = \frac{105{,}000}{x + 215}$, where y is the cost in dollars per ton and x is the tons (in thousands). What size of oil tanker (in thousands of tons) can be built for $350 per ton?

A) 9 thousand tons B) 515 thousand tons C) 186 thousand tons D) 85 thousand tons

Answer: D

Solve the formula for the specified variable.

455) $A = \frac{1}{2}bh$ for b

A) $b = \frac{Ah}{2}$ B) $b = \frac{2A}{h}$ C) $b = \frac{h}{2A}$ D) $b = \frac{A}{2h}$

Answer: B

456) $S = 2\pi rh + 2\pi r^2$ for h

A) $h = \frac{S}{2\pi r} - 1$ B) $h = S - r$ C) $h = 2\pi(S - r)$ D) $h = \frac{S - 2\pi r^2}{2\pi r}$

Answer: D

457) $V = \frac{1}{3}Bh$ for h

A) $h = \frac{3V}{B}$ B) $h = \frac{V}{3B}$ C) $h = \frac{3B}{V}$ D) $h = \frac{B}{3V}$

Answer: A

458) $F = \frac{9}{5}C + 32$ for C

A) $C = \frac{5}{9}(F - 32)$ B) $C = \frac{5}{F - 32}$ C) $C = \frac{F - 32}{9}$ D) $C = \frac{9}{5}(F - 32)$

Answer: A

459) $A = \frac{1}{2}h(a + b)$ for a

A) $a = \frac{hb - 2A}{h}$ B) $a = \frac{2A - hb}{h}$ C) $a = \frac{2Ab - h}{h}$ D) $a = \frac{A - hb}{2h}$

Answer: B

460) $d = rt$ for t

A) $t = \frac{d}{r}$ B) $t = \frac{r}{d}$ C) $t = dr$ D) $t = d - r$

Answer: A

461) $P = 2L + 2W$ for W

A) $W = \frac{P - 2L}{2}$ B) $W = \frac{P - L}{2}$ C) $W = P - 2L$ D) $W = P - L$

Answer: A

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462) $A = P(1 + nr)$ for n

A) $n = \frac{A - P}{Pr}$ B) $n = \frac{Pr}{A - P}$ C) $n = \frac{P - A}{Pr}$ D) $n = \frac{A}{r}$

Answer: A

463) $I = Prt$ for P

A) $P = \frac{I}{rt}$ B) $P = \frac{r - I}{1 + t}$ C) $P = \frac{r - 1}{It}$ D) $P = r - It$

Answer: A

464) $\frac{1}{a} + \frac{1}{b} = \frac{1}{c}$ for c

A) $c = a + b$ B) $c = ab(a + b)$ C) $c = \frac{ab}{a + b}$ D) $c = \frac{a + b}{ab}$

Answer: C

465) $P = \frac{A}{1 + rt}$ for r

A) $r = \frac{P - A}{1 + t}$ B) $r = \frac{A - P}{Pt}$ C) $r = P - At$ D) $r = \frac{P - 1}{At}$

Answer: B

466) $A = \frac{1}{2}h(B + b)$ for B

A) $B = \frac{2A + bh}{h}$ B) $B = \frac{2A - bh}{h}$ C) $B = 2A - bh$ D) $B = \frac{A - bh}{h}$

Answer: B

467) $P = s_1 + s_2 + s_3$ for s_1

A) $s_1 = P + s_2 + s_3$ B) $s_1 = P - s_2 - s_3$ C) $s_1 = s_2 + s_3 - P$ D) $s_1 = P + s_2 - s_3$

Answer: B

468) $I = \frac{nE}{nr + R}$ for n

A) $n = \frac{IR}{Ir + E}$ B) $n = IR(Ir - E)$ C) $n = \frac{-R}{Ir - E}$ D) $n = \frac{IR}{E - Ir}$

Answer: D

Solve the absolute value equation or indicate that the equation has no solution.

469) $|x| = 8$

A) {–8, 8} B) {64} C) {–8} D) {8}

Answer: A

470) $|x - 9| = 5$

A) {–4, 14} B) {4, 14} C) ∅ D) {–14}

Answer: B

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471) $|x - 2| = 9$

A) {11} B) ∅ C) {–11, 7} D) {–7, 11}

Answer: D

472) $|7x + 3| = 6$

A) $\left\{-\frac{3}{7}, \frac{9}{7}\right\}$ B) $\left\{\frac{3}{7}, -\frac{9}{7}\right\}$ C) ∅ D) $\{1, -3\}$

Answer: B

473) $3|x - 3| = 18$

A) {9, –3} B) {3, –9} C) ∅ D) {3}

Answer: A

474) $|x + 2| + 6 = 11$

A) {–7, 3} B) ∅ C) {3} D) {–3, 7}

Answer: A

475) $|5x + 9| + 7 = 15$

A) ∅ B) $\left\{-\frac{17}{9}, -\frac{1}{9}\right\}$ C) $\left\{-\frac{17}{5}, -\frac{1}{5}\right\}$ D) $\left\{\frac{1}{5}, \frac{17}{5}\right\}$

Answer: C

476) $|4x - 7| - 5 = -10$

A) $\left\{\frac{1}{2}\right\}$ B) $\left\{\frac{1}{2}, -3\right\}$ C) ∅ D) $\left\{3, -\frac{1}{2}\right\}$

Answer: C

477) $\left|3 - \frac{1}{5}x\right| = 5$

A) {– 2, 8} B) {40, – 10} C) {–8, – 2} D) {– 40, – 10}

Answer: B

478) $\left|2 - \frac{4}{5}x\right| - 5 = 9$

A) {– 15} B) {15, – 20} C) $\left\{-\frac{48}{5}\right\}$ D) {– 15, 20}

Answer: D

Solve the equation by factoring.

479) $x^2 = x + 42$

A) {6, 7} B) {–6, –7} C) {1, 42} D) {–6, 7}

Answer: D

480) $x^2 + 10x - 24 = 0$

A) {12, 2} B) {12, –2} C) {–12, 1} D) {–12, 2}

Answer: D

Test Bank for Precalculus 7th Blitzer

481) $8x^2 + 26x + 15 = 0$

A) $\left\{-\frac{5}{8}, -\frac{1}{5}\right\}$ B) $\left\{\frac{5}{2}, -\frac{3}{4}\right\}$ C) $\left\{\frac{5}{2}, \frac{3}{4}\right\}$ D) $\left\{-\frac{5}{2}, -\frac{3}{4}\right\}$

Answer: D

482) $9x^2 - 71x = 8$

A) $\left\{-\frac{1}{9}, 8\right\}$ B) $\{-9, 8\}$ C) $\left\{-\frac{1}{9}, 9\right\}$ D) $\left\{\frac{1}{71}, -\frac{1}{9}\right\}$

Answer: A

483) $7x^2 - 3x = 0$

A) $\left\{0, \frac{3}{7}\right\}$ B) $\{0\}$ C) $\left\{-\frac{3}{7}, 0\right\}$ D) $\left\{\frac{3}{7}, -\frac{3}{7}\right\}$

Answer: A

484) $3x(x - 3) = 7x^2 - 10x$

A) $\{0, 4\}$ B) $\left\{-\frac{1}{4}, 0\right\}$ C) $\{0\}$ D) $\left\{0, \frac{1}{4}\right\}$

Answer: D

485) $7 - 7x = (4x + 9)(x - 1)$

A) $\{-1, 4\}$ B) $\{1\}$ C) $\left\{1, -\frac{9}{4}\right\}$ D) $\{-4, 1\}$

Answer: D

486) $-6x - 2 = (3x + 1)^2$

A) $\left\{-1, -\frac{1}{3}\right\}$ B) $\left\{\frac{1}{3}, 1\right\}$ C) $\left\{-\frac{1}{3}\right\}$ D) $\varnothing$

Answer: A

Solve the quadratic equation by the square root property.

487) $2x^2 = 32$

A) $\{-4\sqrt{2}, 4\sqrt{2}\}$ B) $\{-4, 4\}$ C) $\{-2, 2\}$ D) $\{0\}$

Answer: B

488) $4x^2 = 28$

A) $\{8\}$ B) $\{14\}$ C) $\{-\sqrt{7}, \sqrt{7}\}$ D) $\{-7, 7\}$

Answer: C

489) $2x^2 + 4 = 342$

A) $\{13\}$ B) $\{-14, 14\}$ C) $\{171\}$ D) $\{-13, 13\}$

Answer: D

490) $(x - 6)^2 = 25$

A) $\{-11, 1\}$ B) $\{-5, 5\}$ C) $\{31\}$ D) $\{1, 11\}$

Answer: D

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491) $(2x - 1)^2 = 9$

A) {–4, 2} B) {–2, 4} C) {–2, 1} D) {–1, 2}

Answer: D

492) $(2x + 3)^2 = 25$

A) {1, 4} B) {–4, 1} C) {–14, 14} D) {0, 1}

Answer: B

493) $3(x - 8)^2 = 15$

A) $\{-8 - \sqrt{5}, -8 + \sqrt{5}\}$ B) {3, 13} C) {–13, –3} D) $\{8 - \sqrt{5}, 8 + \sqrt{5}\}$

Answer: D

494) $(2x + 3)^2 = 7$

A) $\{-5, 2\}$

B) $\left\{\frac{\sqrt{7} - 3}{2}, \frac{\sqrt{7} + 3}{2}\right\}$

C) $\left\{\frac{-3 - \sqrt{7}}{2}, \frac{-3 + \sqrt{7}}{2}\right\}$

D) $\left\{\frac{3 - \sqrt{7}}{2}, \frac{3 + \sqrt{7}}{2}\right\}$

Answer: C

495) $(11x - 3)^2 = 12$

A) $\left\{\frac{3 - 2\sqrt{3}}{11}, \frac{3 + 2\sqrt{3}}{11}\right\}$

B) $\{-2\sqrt{11}, 2\sqrt{11}\}$

C) $\left\{-\frac{9}{11}, \frac{15}{11}\right\}$

D) $\left\{\frac{-3 - 2\sqrt{3}}{11}, \frac{-3 + 2\sqrt{3}}{11}\right\}$

Answer: A

Solve the quadratic equation by completing the square.

496) $x^2 - 8x - 33 = 0$

A) {–3, 11} B) {–3, –30} C) $\{-\sqrt{33}, \sqrt{33}\}$ D) {–11, 3}

Answer: A

497) $x^2 + 14x = -38$

A) $\{-14 + \sqrt{38}\}$ B) $\{-7 - \sqrt{11}, -7 + \sqrt{11}\}$

C) $\{7 + \sqrt{11}\}$ D) $\{7 - \sqrt{38}, 7 + \sqrt{38}\}$

Answer: B

498) $x^2 + 14x + 30 = 0$

A) $\{-7 - \sqrt{19}, -7 + \sqrt{19}\}$ B) $\{7 - \sqrt{30}, 7 + \sqrt{30}\}$

C) $\{-14 + \sqrt{30}\}$ D) $\{7 + \sqrt{19}\}$

Answer: A

499) $x^2 + 8x - 3 = 0$

A) $\{-4 - \sqrt{19}, -4 + \sqrt{19}\}$ B) $\{-1 - \sqrt{19}, -1 + \sqrt{19}\}$

C) $\{-4 - 1\sqrt{19}, -4 + 1\sqrt{19}\}$ D) $\{4 + \sqrt{19}\}$

Answer: A

Test Bank for Precalculus 7th Blitzer

500) $x^2 - 12x - 5 = 0$

A) $\{6 - \sqrt{41}, 6 + \sqrt{41}\}$ B) $\{-6 - \sqrt{41}, -6 + \sqrt{41}\}$

C) $\{6 - \sqrt{5}, 6 + \sqrt{5}\}$ D) $\{12 - \sqrt{149}, 12 + \sqrt{149}\}$

Answer: A

501) $z^2 + 16z + 44 = 0$

A) $\{8 + 2\sqrt{5}\}$ B) $\{-8 + 2\sqrt{5}, -8 - 2\sqrt{5}\}$

C) $\{8 + 2\sqrt{11}, 8 - 2\sqrt{11}\}$ D) $\{-16 + 2\sqrt{11}\}$

Answer: B

502) $x^2 + 4x = 16$

A) $\{-2 - 2\sqrt{5}, -2 + 2\sqrt{5}\}$ B) $\{2\sqrt{5} - 2, 2\sqrt{5} + 2\}$

C) $\{-2\sqrt{5}, 2\sqrt{5}\}$ D) $\{-2 - 2\sqrt{10}, -2 + 2\sqrt{10}\}$

Answer: A

503) $x^2 + 3x - 9 = 0$

A) $\left\{\frac{-3 - 3\sqrt{5}}{2}\right\}$ B) $\left\{\frac{3 + 3\sqrt{5}}{2}\right\}$

C) $\left\{\frac{-3 - 3\sqrt{5}}{2}, \frac{-3 + 3\sqrt{5}}{2}\right\}$ D) $\{-3 - 3\sqrt{5}, -3 + 3\sqrt{5}\}$

Answer: C

504) $7x^2 - 2x - 3 = 0$

A) $\left\{\frac{-1 - \sqrt{22}}{7}, \frac{-1 + \sqrt{22}}{7}\right\}$ B) $\left\{-3, \frac{23}{7}\right\}$

C) $\left\{\frac{1 - \sqrt{22}}{7}, \frac{1 + \sqrt{22}}{7}\right\}$ D) $\left\{\frac{7 - \sqrt{22}}{49}, \frac{7 + \sqrt{22}}{49}\right\}$

Answer: C

Solve the quadratic equation using the quadratic formula.

505) $x^2 + 2x - 63 = 0$

A) $\{-7, 9\}$ B) $\{9, 7\}$ C) $\{-9, 7\}$ D) $\{-9, 1\}$

Answer: C

506) $x^2 + 10x + 14 = 0$

A) $\{5 + \sqrt{11}\}$ B) $\{5 - \sqrt{14}, 5 + \sqrt{14}\}$

C) $\{-10 + \sqrt{14}\}$ D) $\{-5 - \sqrt{11}, -5 + \sqrt{11}\}$

Answer: D

507) $x^2 + 4x = 3$

A) $\{-2 - \sqrt{7}, -2 + \sqrt{7}\}$ B) $\{-2 - 2\sqrt{7}, -2 + 2\sqrt{7}\}$

C) $\{2 + \sqrt{7}\}$ D) $\{-1 - \sqrt{7}, -1 + \sqrt{7}\}$

Answer: A

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508) $x^2 + 5x + 1 = 0$

A) $\left\{\frac{5-\sqrt{21}}{2}, \frac{5+\sqrt{21}}{2}\right\}$

B) $\left\{\frac{-5-\sqrt{21}}{10}, \frac{-5+\sqrt{21}}{10}\right\}$

C) $\left\{\frac{-5-\sqrt{21}}{2}, \frac{-5+\sqrt{21}}{2}\right\}$

D) $\left\{\frac{-5-\sqrt{29}}{2}, \frac{-5+\sqrt{29}}{2}\right\}$

Answer: C

509) $2x^2 + 10x + 7 = 0$

A) $\left\{\frac{-5-\sqrt{11}}{2}, \frac{-5+\sqrt{11}}{2}\right\}$

B) $\left\{\frac{-10-\sqrt{11}}{2}, \frac{-10+\sqrt{11}}{2}\right\}$

C) $\left\{\frac{-5-\sqrt{11}}{4}, \frac{-5+\sqrt{11}}{4}\right\}$

D) $\left\{\frac{-5-\sqrt{39}}{2}, \frac{-5+\sqrt{39}}{2}\right\}$

Answer: A

510) $2x^2 + x - 5 = 0$

A) $\varnothing$

B) $\left\{\frac{-1-\sqrt{41}}{4}, \frac{-1+\sqrt{41}}{4}\right\}$

C) $\left\{\frac{-1-\sqrt{41}}{2}, \frac{-1+\sqrt{41}}{2}\right\}$

D) $\left\{\frac{1-\sqrt{41}}{4}, \frac{1+\sqrt{41}}{4}\right\}$

Answer: B

511) $7x^2 = -10x - 2$

A) $\left\{\frac{-5-\sqrt{39}}{7}, \frac{-5+\sqrt{39}}{7}\right\}$

B) $\left\{\frac{-10-\sqrt{11}}{7}, \frac{-10+\sqrt{11}}{7}\right\}$

C) $\left\{\frac{-5-\sqrt{11}}{7}, \frac{-5+\sqrt{11}}{7}\right\}$

D) $\left\{\frac{-5-\sqrt{11}}{14}, \frac{-5+\sqrt{11}}{14}\right\}$

Answer: C

Compute the discriminant. Then determine the number and type of solutions for the given equation.

512) $x^2 + 3x + 2 = 0$

A) 1; two unequal real solutions

B) −17; no real solution

C) 1; one real solution

D) 0; one real solution

Answer: A

513) $x^2 - 10x + 25 = 0$

A) −100; two unequal real solutions

B) −100; no real solution

C) 100; two unequal real solutions

D) 0; one real solution

Answer: D

514) $7x^2 = -2x - 1$

A) −24; no real solution

B) 0; one real solution

C) 32; two unequal real solutions

D) −32; no real solution

Answer: A

Test Bank for Precalculus 7th Blitzer

Solve the quadratic equation by the method of your choice.

515) $(4x + 7)^2 = 4$

A) $\left\{\frac{3}{4}\right\}$ B) $\left\{-\frac{5}{4}, 0\right\}$ C) $\left\{-\frac{9}{4}, -\frac{5}{4}\right\}$ D) $\left\{\frac{5}{4}, \frac{9}{4}\right\}$

Answer: C

516) $9x^2 - 35x - 4 = 0$

A) $\left\{-\frac{1}{9}, 4\right\}$ B) $\left\{-\frac{1}{9}, \frac{1}{35}\right\}$ C) $\left\{-\frac{1}{9}, 9\right\}$ D) $\{-9, 4\}$

Answer: A

517) $2x^2 = 7x + 9$

A) $\left\{\frac{2}{9}, 0\right\}$ B) $\left\{\frac{2}{9}, -1\right\}$ C) $\left\{\frac{9}{2}, -1\right\}$ D) $\left\{\frac{2}{9}, 1\right\}$

Answer: C

518) $3x^2 - 9 = 26x$

A) $\left\{\frac{1}{26}, -\frac{1}{3}\right\}$ B) $\{-3, 9\}$ C) $\left\{-\frac{1}{3}, 9\right\}$ D) $\left\{-\frac{1}{3}, 3\right\}$

Answer: C

519) $3x^2 - 108 = 0$

A) $\{-6\sqrt{3}, 6\sqrt{3}\}$ B) $\{-6, 6\}$ C) $\{0\}$ D) $\{-3, 3\}$

Answer: B

520) $x^2 + 6x = -9$

A) $\{3\}$ B) $\{-\sqrt{3}\}$ C) $\{-3, 3]$ D) $\{-3\}$

Answer: D

521) $x^2 + 4x = 3$

A) $\{-2 - \sqrt{7}, -2 + \sqrt{7}\}$ B) $\{-2 - 2\sqrt{7}, -2 + 2\sqrt{7}\}$

C) $\{2 + \sqrt{7}\}$ D) $\{-1 - \sqrt{7}, -1 + \sqrt{7}\}$

Answer: A

522) $3x^2 + 8x = -2$

A) $\left\{\frac{-4 - \sqrt{22}}{3}, \frac{-4 + \sqrt{22}}{3}\right\}$ B) $\left\{\frac{-4 - \sqrt{10}}{6}, \frac{-4 + \sqrt{10}}{6}\right\}$

C) $\left\{\frac{-4 - \sqrt{10}}{3}, \frac{-4 + \sqrt{10}}{3}\right\}$ D) $\left\{\frac{-8 - \sqrt{10}}{3}, \frac{-8 + \sqrt{10}}{3}\right\}$

Answer: C

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523) $2x^2 = -10x - 5$

A) $\left\{\frac{-10-\sqrt{15}}{2}, \frac{-10+\sqrt{15}}{2}\right\}$

B) $\left\{\frac{-5-\sqrt{15}}{2}, \frac{-5+\sqrt{15}}{2}\right\}$

C) $\left\{\frac{-5-\sqrt{35}}{2}, \frac{-5+\sqrt{35}}{2}\right\}$

D) $\left\{\frac{-5-\sqrt{15}}{4}, \frac{-5+\sqrt{15}}{4}\right\}$

Answer: B

524) $4x^2 + 12x + 6 = 0$

A) $\left\{\frac{-12-\sqrt{3}}{2}, \frac{-12+\sqrt{3}}{2}\right\}$

B) $\left\{\frac{-3-\sqrt{3}}{2}, \frac{-3+\sqrt{3}}{2}\right\}$

C) $\left\{\frac{-3-\sqrt{15}}{2}, \frac{-3+\sqrt{15}}{2}\right\}$

D) $\left\{\frac{-3-\sqrt{3}}{8}, \frac{-3+\sqrt{3}}{8}\right\}$

Answer: B

525) $5x^2 = 65$

A) $\{-13, 13\}$ B) $\{32.5\}$ C) $\{14\}$ D) $\{-\sqrt{13}, \sqrt{13}\}$

Answer: D

526) $11x^2 - 55 = 0$

A) $\left\{-\frac{\sqrt{55}}{11}, \frac{\sqrt{55}}{11}\right\}$ B) $\{-\sqrt{5}, \sqrt{5}\}$ C) $\{\sqrt{5}\}$ D) $\{-\sqrt{55}, \sqrt{55}\}$

Answer: B

527) $x^2 + 10x + 15 = 0$

A) $\{-10 + \sqrt{15}\}$

B) $\{5 + \sqrt{10}\}$

C) $\{5 - \sqrt{15}, 5 + \sqrt{15}\}$

D) $\{-5 - \sqrt{10}, -5 + \sqrt{10}\}$

Answer: D

528) $(5x + 3)^2 = 5$

A) $\left\{-\frac{8}{5}, \frac{2}{5}\right\}$

B) $\left\{\frac{\sqrt{5}-3}{5}, \frac{\sqrt{5}+3}{5}\right\}$

C) $\left\{\frac{-3-\sqrt{5}}{5}, \frac{-3+\sqrt{5}}{5}\right\}$

D) $\left\{\frac{3-\sqrt{5}}{5}, \frac{3+\sqrt{5}}{5}\right\}$

Answer: C

529) $(x + 4)(x - 9) = 7$

A) $\left\{\frac{5-\sqrt{197}}{2}, \frac{5+\sqrt{197}}{2}\right\}$

B) $\left\{\frac{5-i\sqrt{197}}{2}, \frac{5+i\sqrt{197}}{2}\right\}$

C) $\left\{\frac{-5-\sqrt{197}}{2}, \frac{-5+\sqrt{197}}{2}\right\}$

D) $\left\{\frac{-5-i\sqrt{197}}{2}, \frac{-5+i\sqrt{197}}{2}\right\}$

Answer: A

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530) $\frac{x^2}{18} + x + \frac{59}{18} = 0$

A) $\{9 + \sqrt{22}\}$
B) $\{9 - \sqrt{59}, 9 + \sqrt{59}\}$
C) $\{-9 - \sqrt{22}, -9 + \sqrt{22}\}$
D) $\{-18 + \sqrt{59}\}$

Answer: C

531) $\frac{1}{x+7} + \frac{1}{x} = \frac{1}{5}$

A) $\left\{\frac{3 - \sqrt{149}}{2}, \frac{3 + \sqrt{149}}{2}\right\}$
B) $\left\{\frac{17 - \sqrt{149}}{2}, \frac{17 + \sqrt{149}}{2}\right\}$
C) $\left\{\frac{-17 - \sqrt{149}}{2}, \frac{-17 + \sqrt{149}}{2}\right\}$
D) $\left\{\frac{-3 - \sqrt{149}}{2}, \frac{-3 + \sqrt{149}}{2}\right\}$

Answer: A

532) $\frac{9}{x-7} + \frac{x}{x+7} = \frac{67}{x^2 - 49}$

A) $\{1 - \sqrt{23}, 1 + \sqrt{23}\}$
B) $\{-1 - \sqrt{23}, -1 + \sqrt{23}\}$
C) $\{1 - \sqrt{5}, 1 + \sqrt{5}\}$
D) $\{-1 - \sqrt{5}, -1 + \sqrt{5}\}$

Answer: D

533) $\frac{y}{y+4} + \frac{8y+28}{y^2+7y+12} = \frac{4}{y+3}$

A) $\{4, 3\}$
B) $\{-3, -4\}$
C) $\{-6, 5\}$
D) $\varnothing$

Answer: D

534) $5x^2 - \sqrt{3}x - 1 = 0$

A) $\left\{\frac{-\sqrt{3} - \sqrt{23}}{10}, \frac{-\sqrt{3} + \sqrt{23}}{10}\right\}$
B) $\left\{\frac{\sqrt{3} - i\sqrt{17}}{10}, \frac{\sqrt{3} + i\sqrt{17}}{10}\right\}$
C) $\left\{\frac{\sqrt{3} - \sqrt{29}}{10}, \frac{\sqrt{3} + \sqrt{29}}{10}\right\}$
D) $\left\{\frac{\sqrt{3} - \sqrt{23}}{10}, \frac{\sqrt{3} + \sqrt{23}}{10}\right\}$

Answer: D

Solve the radical equation, and check all proposed solutions.

535) $\sqrt{x+2} = 2$

A) $\{6\}$
B) $\{4\}$
C) $\{2\}$
D) $\{16\}$

Answer: C

536) $\sqrt{3x-2} = 2$

A) $\{2\}$
B) $\{4\}$
C) $\varnothing$
D) $\left\{\frac{2}{3}\right\}$

Answer: A

537) $\sqrt{x-3} = x - 5$

A) $\{4\}$
B) $\{7\}$
C) $\{4, 7\}$
D) $\{-7\}$

Answer: B

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538) $\sqrt{6x + 27} = x$

A) {–3, 9} B) ∅ C) $\left\{-\frac{27}{5}\right\}$ D) {9}

Answer: D

539) $\sqrt{12x - 12} = x + 2$

A) {4} B) {–4} C) {6} D) {–3}

Answer: A

540) $x - 7 = \sqrt{3x + 7}$

A) {7} B) {14} C) {3, 14} D) ∅

Answer: B

541) $\sqrt{14x - 7} - 3 = x$

A) {–4} B) {4} C) {–3} D) {3}

Answer: B

542) $x - \sqrt{3x - 2} = 4$

A) {1, 2} B) {2, 9} C) {–1} D) {9}

Answer: D

543) $\sqrt{2x} + 11 = x + 7$

A) {2, 8} B) {–4} C) $\left\{-4, \frac{4}{3}\right\}$ D) {8}

Answer: D

Solve the problem.

544) For a culture of 60,000 bacteria of a certain strain, the number of bacteria N that will survive x hours is modeled by the formula $N = 6{,}000\sqrt{100 - x}$. After how many hours will 42,000 bacteria survive?

A) 49 hr B) 58 hr C) 51 hr D) 93 hr

Answer: C

545) The formula $L = 6.75\sqrt{x} + 12$ models the amount, L, in billions of dollars of new student loans x years after 1993. According to the model, in what year is the amount loaned expected to reach $32.25 billion?

A) 2,005 B) 2,006 C) 2,007 D) 2,002

Answer: D

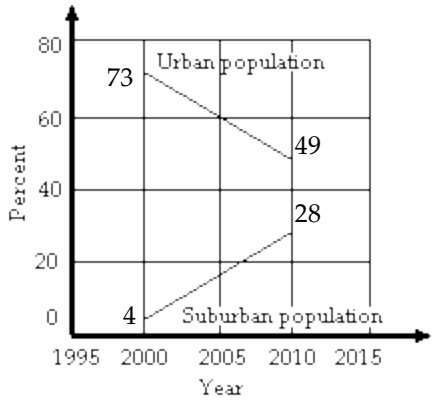
546) A local race for charity has taken place since 1993. In 1993, the winning speed was 6 miles per hour. The winning speed increased, on average, by 0.17 miles per hour each year in the period 1993–1998. If this trend continues, in which year is the winning speed predicted to be 8.04 mph?

A) 2,006 B) 2,004 C) 2,005 D) 2,007

Answer: C

Test Bank for Precalculus 7th Blitzer

547) The following graph shows that more and more people in a certain country are moving from urban areas to the suburbs. In 2000, the percentage of the population living in urban areas was 73 and this percentage decreased by 2.4 each year, on average, in the period 2000–2010. In 2000, the percentage of the population living in the suburbs was 4 and this percentage increased by 2.4 each year, on average, in the period 2000–2010. Assuming this trend continues, estimate the year in which the percentage of the population living in urban areas will be equal to the percentage living in the suburbs.



A) 2,012 B) 2,020 C) 2,016 D) 2,015

Answer: D

548) A car rental agency charges $175 per week plus $0.25 per mile to rent a car. How many miles can you travel in one week for $200?

A) 100 mi B) 75 mi C) 800 mi D) 225 mi

Answer: A

549) A train ticket in a certain city is $2.50. People who use the train also have the option of purchasing a frequent rider pass for $18.75 each month. With the pass, each ticket costs only $1.75. Determine the number of times in a month the train must be used so that the total monthly cost without the pass is the same as the total monthly cost with the pass.

A) 25 times B) 26 times C) 27 times D) 24 times

Answer: A

550) You inherit $10,000 with the stipulation that for the first year the money must be invested in two stocks paying 6% and 11% annual interest, respectively. How much should be invested at each rate if the total interest earned for the year is to be $800?

A) $7,000 invested at 6%; $3,000 invested at 11%
B) $6,000 invested at 6%; $4,000 invested at 11%
C) $4,000 invested at 6%; $6,000 invested at 11%
D) $5,000 invested at 6%; $5,000 invested at 11%

Answer: B

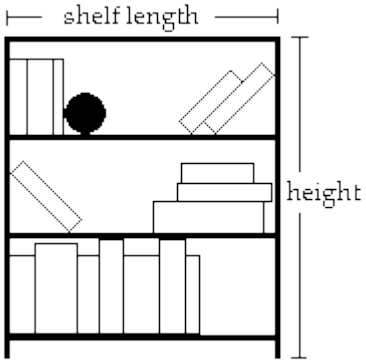
551) You inherit $56,000 from a very wealthy grandparent, with the stipulation that for the first year, the money must be invested in two stocks paying 4% and 10% annual interest, respectively. How much should be invested at each rate if the total interest earned for the year is to be $3,200?

A) $30,000 invested at 4%; $26,000 invested at 10%
B) $16,000 invested at 4%; $40,000 invested at 10%
C) $40,000 invested at 4%; $16,000 invested at 10%
D) $26,000 invested at 4%; $30,000 invested at 10%

Answer: C

Test Bank for Precalculus 7th Blitzer

552) A bookcase is to be constructed as shown in the figure below. The height of the bookcase is 3 feet longer than the length of a shelf. If 24 feet of lumber is available for the entire unit (including the shelves, but NOT the back of the bookcase), find the length and height of the unit.



A) length: 3 ft; height: 9 ft
B) length: 4.5 ft; height: 7.5 ft
C) length: 3 ft; height: 6 ft
D) length: 10.5 ft; height: 13.5 ft

Answer: C

553) An auto repair shop charged a customer $343 to repair a car. The bill listed $73 for parts and the remainder for labor. If the cost of labor is $45 per hour, how many hours of labor did it take to repair the car?
A) 7 hr
B) 5 hr
C) 6 hr
D) 6.5 hr

Answer: C

554) After a 17% price reduction, a boat sold for $29,050. What was the boat's price before the reduction? (Round to the nearest cent, if necessary.)
A) $33,988.50
B) $4,938.50
C) $170,882.35
D) $35,000

Answer: D

555) Inclusive of a 7.2% sales tax, a diamond ring sold for $2,251.20. Find the price of the ring before the tax was added. (Round to the nearest cent, if necessary.)
A) $2,413.29
B) $162.09
C) $2,100
D) $2,089.11

Answer: C

556) The selling price of a painting is $220. If the markup is 30% of the dealer's cost, what is the dealer's cost of the painting?
A) $169.23
B) $66.00
C) $6.60
D) $2,134.00

Answer: A

557) The perimeter of a rectangle is 16 cm. The length is 4 cm longer than the width. Find the dimensions.
A) Width: 4 cm; length: 8 cm
B) Width: 2 cm; length: 4 cm
C) Width: 2 cm; length: 6 cm
D) Width: 3 cm; length: 7 cm

Answer: C

558) The length of a rectangular room is 2 feet longer than twice the width. If the room's perimeter is 184 feet, what are the room's dimensions?
A) Width: 35 ft; length: 72 ft
B) Width: 30 ft; length: 62 ft
C) Width: 60 ft; length: 124 ft
D) Width: 45 ft; length: 47 ft

Answer: B

Test Bank for Precalculus 7th Blitzer

559) A diagonal crosswalk at an intersection of First Street and Grand Avenue is the hypotenuse of a triangle in which crosswalks across each street are the legs. First Street is 24 feet wide and Grand Avenue is 40 feet wide. How much shorter is the distance traveled by pedestrians using the diagonal crosswalk rather than using both crosswalks that form the legs of the triangle?

A) 16 ft B) 6.6 ft C) 17.4 ft D) 46.6 ft

Answer: C

560) There are 14 more sophomores than juniors in an 8 AM algebra class. If there are 46 students in this class, find the number of sophomores and the number of juniors in the class.

A) 60 sophomores; 32 juniors
B) 16 sophomores; 30 juniors
C) 30 sophomores; 16 juniors
D) 46 sophomores; 32 juniors

Answer: C

561) The president of a certain university makes three times as much money as one of the department heads. If the total of their salaries is $180,000, find each worker's salary.

A) president's salary: $135,000; department head's salary: $45,000
B) president's salary: $45,000; department head's salary: $135,000
C) president's salary: $90,000; department head's salary: $45,000
D) president's salary: $13,500; department head's salary: $4,500

Answer: A

562) During a road trip, Tony drove one–third the distance that Lana drove. Mark drives 15 more miles than Lana drove. The total distance they drove on the trip was 519 miles. How many miles did each person drive?

A) Tony: 648 mi, Lana: 216 mi, Mark: 201 mi
B) Tony: 67 mi, Lana: 201 mi, Mark: 216 mi
C) Tony: 216 mi, Lana: 648 mi, Mark: 663 mi
D) Tony: 72 mi, Lana: 216 mi, Mark: 231 mi

Answer: D

563) The sum of the angles of a triangle is 180°. Find the three angles of the triangle if one angle is three times the smallest angle and the third angle is 25° greater than the smallest angle.

A) 16°, 41°, 123° B) 16°, 48°, 116° C) 22°, 66°, 92° D) 31°, 93°, 56°

Answer: D

564) In a recent International Gymnastics competition, the U.S., China, and Romania were the big winners. If the total number of medals won by each team are three consecutive integers whose sum is 84 and the U.S. won more than China who won more than Romania, how many medals did each team win?

A) U.S.: 29 medals; China: 28 medals; Romania: 27 medals
B) U.S.: 27 medals; China: 26 medals; Romania: 25 medals
C) U.S.: 30 medals; China: 29 medals; Romania: 28 medals
D) U.S.: 86 medals; China: 85 medals; Romania: 84 medals

Answer: A

565) Sybil is having her yard landscaped. She obtained an estimate from two landscaping companies. Company A gave an estimate of $190 for materials and equipment rental plus $50 per hour for labor. Company B gave an estimate of $280 for materials and equipment rental plus $35 per hour for labor. Determine how many hours of labor will be required for the two companies to cost the same.

A) 9 hr B) 5 hr C) 6 hr D) 10 hr

Answer: C

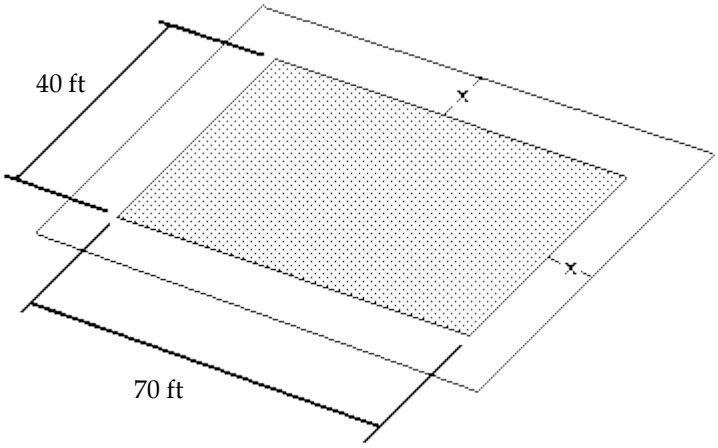
Test Bank for Precalculus 7th Blitzer

566) Sergio's internet provider charges its customers $13 per month plus 3¢ per minute of on–line usage. Sergio received a bill from the provider covering a 5–month period and was charged a total of $89.90. How many minutes did he spend on–line during that period? (Round to the nearest whole minute, if necessary.)

A) 830 min B) 83 min C) 2,083 min D) 1,816 min

Answer: A

567) The rectangular swimming pool in the figure shown measures 40 feet by 70 feet and contains a path of uniform width around the four edges. The perimeter of the rectangle formed by the pool and the surrounding path is 244 feet. Determine the width of the path.



A) 6 ft B) 33.5 ft C) 9 ft D) 3 ft

Answer: D

568) A rectangular parking lot has a length that is 5 yards greater than the width. The area of the parking lot is 176 square yards. Find the length and the width.

A) Width: 21 yd; length: 26 yd
B) Width: 6 yd; length: 11 yd
C) Width: 11 yd; length: 16 yd
D) Width: 16 yd; length: 21 yd

Answer: C

569) Each side of a square is lengthened by 3 inches. The area of this new, larger square is 100 square inches. Find the length of a side of the original square.

A) 10 in. B) 7 in. C) 9 in. D) 4 in.

Answer: B

570) Use the formula Time traveled $= \frac{\text{Distance traveled}}{\text{Average Velocity}}$. A passenger train can travel 270 miles in the same amount of time it takes a freight train to travel 180 miles. If the average velocity of the freight train is 15 miles per hour slower than the average velocity of the passenger train, find the average velocity of each.

A) passenger train: 60 mph
freight train: 45 mph
B) passenger train: 45 mph
freight train: 30 mph
C) passenger train: 30 mph
freight train: 15 mph
D) passenger train: 75 mph
freight train: 60 mph

Answer: B

Test Bank for Precalculus 7th Blitzer

571) A cruise boat travels 84 miles downstream in 3 hours and returns to its starting point upstream in 6 hours. Find the speed of the stream.

A) 7 mph B) 49 mph C) 28 mph D) 21 mph

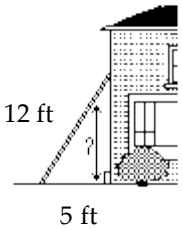
Answer: A

572) Judy has a rectangular garden 14 by 22 feet. She wants to put a grass border around the garden with a uniform width on all sides. If she has enough grass seed to cover 460 square feet, how wide can the grass border be?

A) 5 ft B) 2.5 ft C) 10 ft D) 7 ft

Answer: A

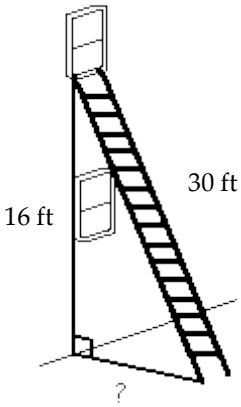
573) A 12–foot ladder is leaning against a house with the base of the ladder 5 feet from the house. How high up the house does the ladder reach? If necessary, round to the nearest tenth foot.



A) 10.9 ft B) 13 ft C) 11 ft D) 7 ft

Answer: A

574) A 30–ft–tall ladder is placed so that it reaches 16 ft up on the wall of a house. How far is the base of the ladder from the wall of the house? If necessary, round to the nearest tenth foot.



A) 25.4 ft B) 644 ft C) 34 ft D) 1,156 ft

Answer: A

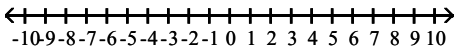
575) Two cars leave an intersection. One car travels north; the other east. When the car traveling north had gone 6 miles, the distance between the cars was 2 miles more than the distance traveled by the car heading east. How far had the east bound car traveled?

A) 12 mi B) 8 mi C) 10 mi D) 6 mi

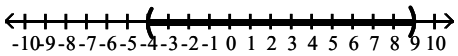
Answer: B

Express the interval in set–builder notation and graph the interval on a number line.

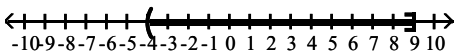
576) $(-4, 9]$



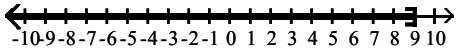
A) $\{x \mid -4 < x < 9\}$



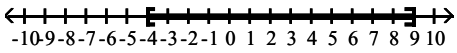
B) $\{x \mid -4 < x \le 9\}$



C) $\{x \mid x \le 9\}$

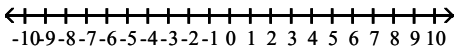


D) $\{x \mid -4 \le x \le 9\}$

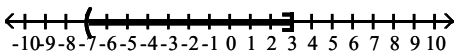


Answer: B

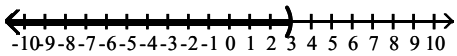
577) $[-7, 3)$



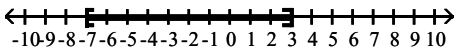
A) $\{x \mid -7 < x \le 3\}$



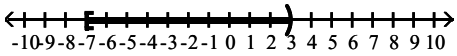
B) $\{x \mid x < 3\}$



C) $\{x \mid -7 \le x \le 3\}$

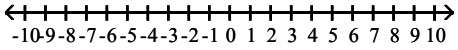


D) $\{x \mid -7 \le x < 3\}$

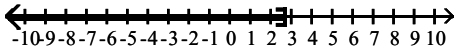


Answer: D

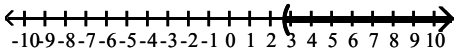
578) $\left(-\infty, \frac{8}{3}\right)$



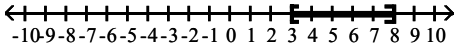
A) $\left\{x \mid x \le \frac{8}{3}\right\}$



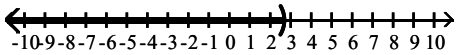
B) $\left\{x \mid x > \frac{8}{3}\right\}$



C) $\{x \mid 3 \le x \le 8\}$



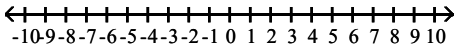
D) $\left\{x \mid x < \frac{8}{3}\right\}$



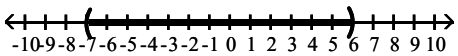
Answer: D

Test Bank for Precalculus 7th Blitzer

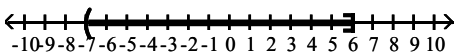
579) [−7, 6]



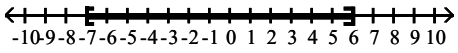
A) {x | −7 < x < 6}



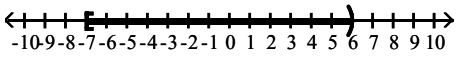
B) {x | −7 < x ≤ 6}



C) {x | −7 ≤ x ≤ 6}

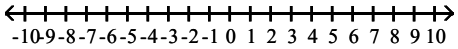


D) {x | −7 ≤ x < 6}

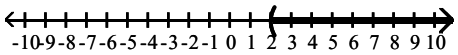


Answer: C

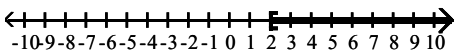
580) (2, ∞)



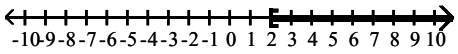
A) {x | x > 2}



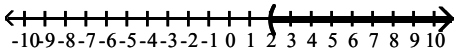
B) {x | x > 2}



C) {x | x ≥ 2}

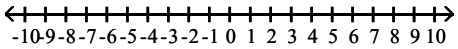


D) {x | x ≥ 2}

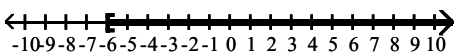


Answer: A

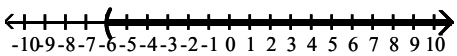
581) [−6, ∞)



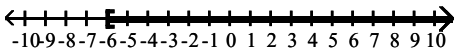
A) {x | x > −6}



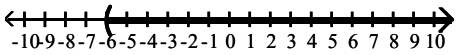
B) {x | x ≥ −6}



C) {x | x ≥ −6}

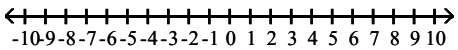


D) {x | x > −6}

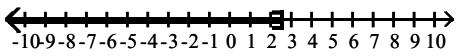


Answer: C

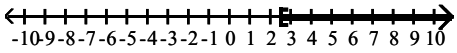
582) (−∞, 2.5]



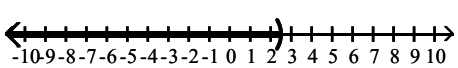
A) {x | x ≤ 2.5}



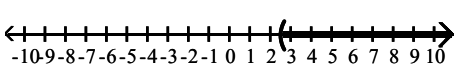
B) {x | x ≥ 2.5}



C) {x | x < 2.5}



D) {x | x > 2.5}



Answer: A

Test Bank for Precalculus 7th Blitzer

Use graphs to find the set.

583) $(-10, 0) \cap [-3, 2]$

A) $(0, 2]$ B) $(-10, -3]$ C) $(-10, 2]$ D) $[-3, 0)$

Answer: D

584) $(-9, 0) \cup [-2, 3]$

A) $(-9, -2]$ B) $(-9, 3]$ C) $[-2, 0)$ D) $(0, 3]$

Answer: B

585) $(-\infty, 7) \cap [-7, 19)$

A) $(-\infty, -7]$ B) $(-\infty, 19)$ C) $[-7, 7)$ D) $(7, 19)$

Answer: C

586) $(-\infty, 9) \cup [-3, 11)$

A) $(9, 11)$ B) $(-\infty, 11)$ C) $[-3, 9)$ D) $(-\infty, -3]$

Answer: B

587) $(9, \infty) \cap [18, \infty)$

A) $(-\infty, \infty)$ B) $[18, \infty)$ C) $(9, 18]$ D) $(9, \infty)$

Answer: B

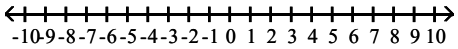
588) $(8, \infty) \cup [11, \infty)$

A) $[11, \infty)$ B) $(8, 11]$ C) $(-\infty, \infty)$ D) $(8, \infty)$

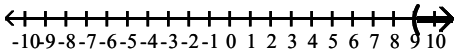
Answer: D

Solve the linear inequality. Other than ∅, use interval notation to express the solution set and graph the solution set on a number line.

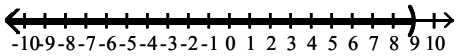
589) $4x + 1 < 37$



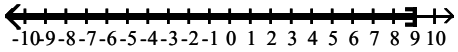
A) $(9, \infty)$



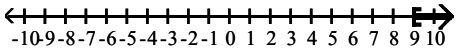
B) $(-\infty, 9)$



C) $(-\infty, 9]$



D) $[9, \infty)$



Answer: B

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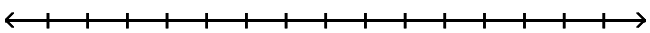
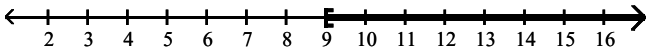
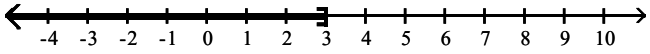
590) $4x - 12 \geq 24$



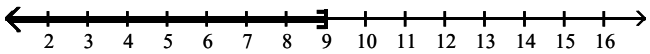
A) $[9, \infty)$



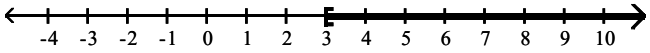
B) $(-\infty, 3]$



C) $(-\infty, 9]$

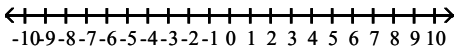


D) $[3, \infty)$

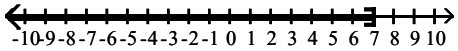


Answer: A

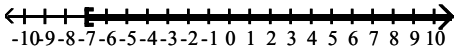
591) $-9x \geq 63$



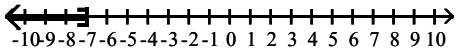
A) $(-\infty, 7]$



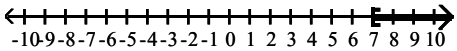
B) $[-7, \infty)$



C) $(-\infty, -7]$

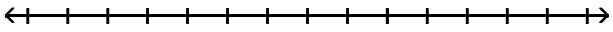


D) $[7, \infty)$

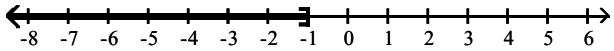


Answer: C

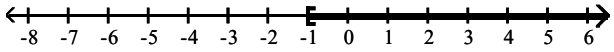
592) $4x - 2 > 3x - 3$



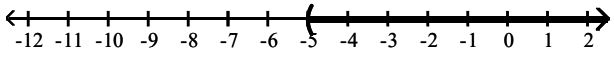
A) $(-\infty, -1]$



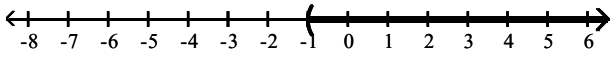
B) $[-1, \infty)$



C) $(-5, \infty)$



D) $(-1, \infty)$



Answer: D

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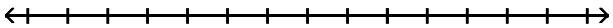
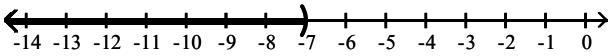
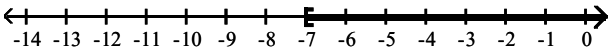
593) $3x + 1 \geq 2x - 6$



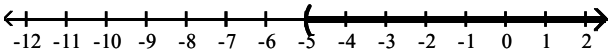
A) $(-\infty, -7)$



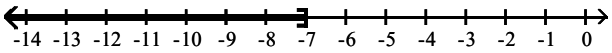
B) $[-7, \infty)$



C) $(-5, \infty)$

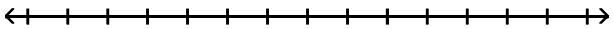


D) $(-\infty, -7]$

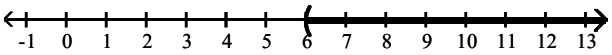


Answer: B

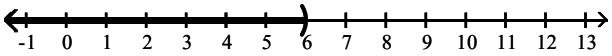
594) $10x + 2 > 2(4x + 7)$



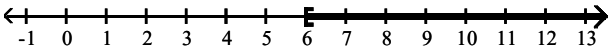
A) $(6, \infty)$



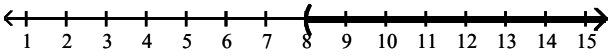
B) $(-\infty, 6)$



C) $[6, \infty)$



D) $(8, \infty)$



Answer: A

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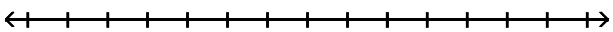
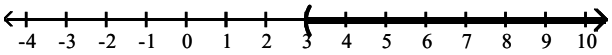
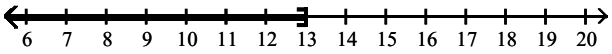
595) $-2(6x + 8) < -14x - 10$



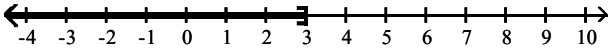
A) $(3, \infty)$



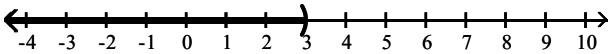
B) $(-\infty, 13]$



C) $(-\infty, 3]$

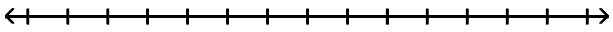


D) $(-\infty, 3)$

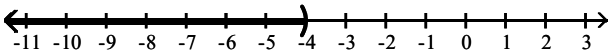


Answer: D

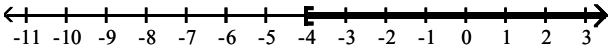
596) $-15x + 5 \leq -5(2x - 5)$



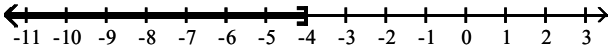
A) $(-\infty, -4)$



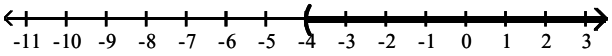
B) $[-4, \infty)$



C) $(-\infty, -4]$

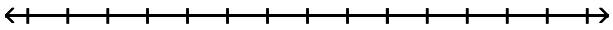


D) $(-4, \infty)$

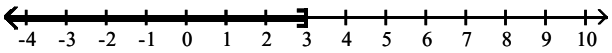


Answer: B

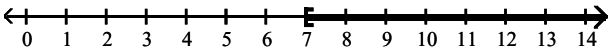
597) $8x + 4 \le 2(3x + 5)$



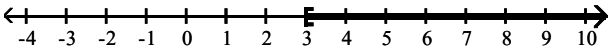
A) $(-\infty, 3]$



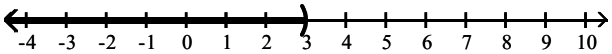
B) $[-\infty, 7)$



C) $[3, \infty)$

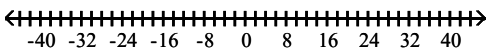


D) $(-\infty, 3)$

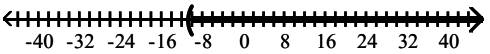


Answer: A

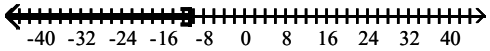
598) $\frac{x}{5} - \frac{1}{5} \le \frac{x}{2} + 3$



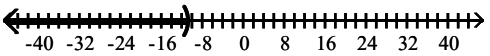
A) $\left(-\frac{32}{3}, \infty\right)$



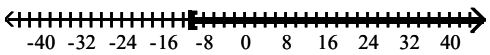
B) $\left(-\infty, -\frac{32}{3}\right]$



C) $\left(-\infty, -\frac{32}{3}\right)$

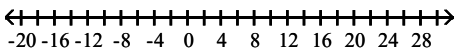


D) $\left[-\frac{32}{3}, \infty\right)$

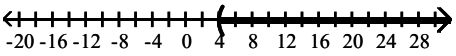


Answer: D

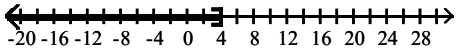
599) $\frac{x-3}{16} \ge \frac{x-3}{20} + \frac{1}{80}$



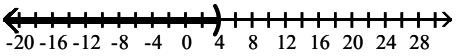
A) $(4, \infty)$



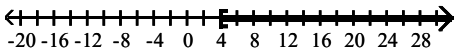
B) $(-\infty, 4]$



C) $(-\infty, 4)$



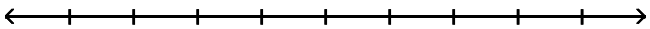
D) $[4, \infty)$



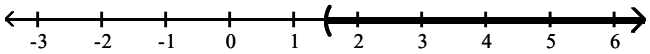
Answer: D

Test Bank for Precalculus 7th Blitzer

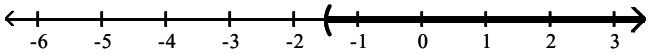
600) $\frac{2}{3} - \frac{8}{9}x < 2$



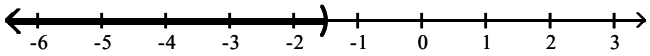
A) $\left(\frac{3}{2}, \infty\right)$



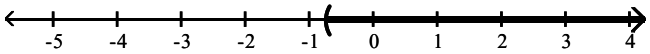
B) $\left(-\frac{3}{2}, \infty\right)$



C) $\left(-\infty, -\frac{3}{2}\right)$

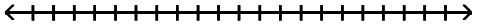


D) $\left(-\frac{3}{4}, \infty\right)$

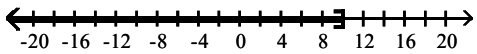


Answer: B

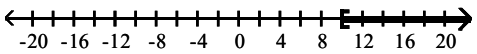
601) $\frac{x}{2} \geq \frac{x}{10} + 4$



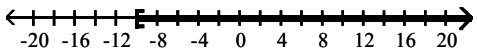
A) $(-\infty, 10]$



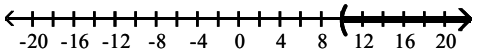
B) $[10, \infty)$



C) $[-10, \infty)$



D) $(10, \infty)$



Answer: B

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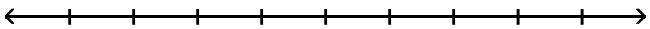
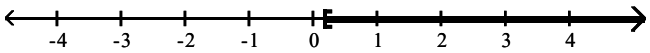
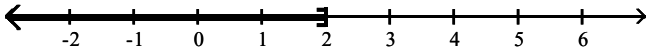
602) $\frac{x}{18} \le \frac{x}{3} - \frac{3x+1}{9}$



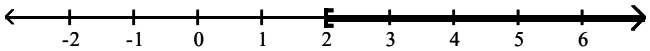
A) $\left[\frac{2}{11}, \infty\right)$



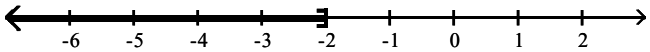
B) $(-\infty, 2]$



C) $[2, \infty)$

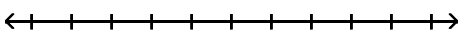


D) $(-\infty, -2]$

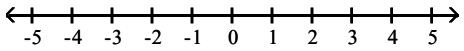


Answer: D

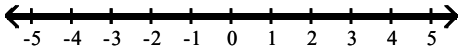
603) $-4(-2 - x) < 6x + 19 - 11 - 2x$



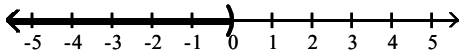
A) $\varnothing$



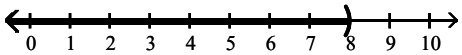
B) $(-\infty, \infty)$



C) $(-\infty, 0)$



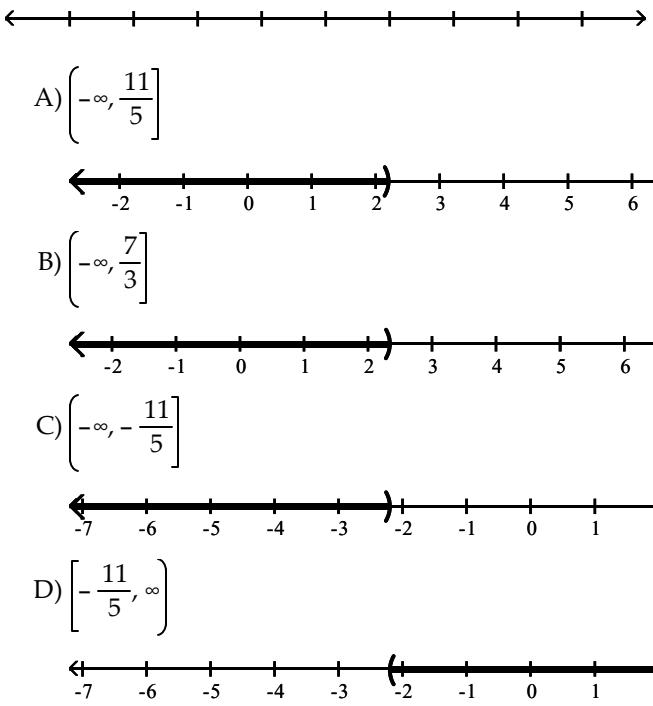
D) $(-\infty, 8)$



Answer: A

Test Bank for Precalculus 7th Blitzer

604) $-4(2x + 1) \geq 2[4x - 3(x - 3)]$



Answer: C

Solve the problem.

605) When making a long distance call from a certain pay phone, the first three minutes of a call cost $2.25. After that, each additional minute or portion of a minute of that call costs $0.25. Use an inequality to find the number of minutes one can call long distance for $5.00.

A) 11 minutes or fewer
B) 2 minutes or fewer
C) 14 minutes or fewer
D) 20 minutes or fewer

Answer: C

606) It takes 19 minutes to set up a candy making machine. Once the machine is set up, it produces 12 candies per minute. Use an inequality to find the number of candies that can be produced in 7 hours if the machine has not yet been set up.

A) 4,812 candies or fewer
B) 84 candies or fewer
C) 1,596 candies or fewer
D) 7,752 candies or fewer

Answer: A

607) A certain store has a fax machine available for use by its customers. The store charges $2.00 to send the first page and $0.65 for each subsequent page. Use an inequality to find the number of pages that can be faxed for $4.60.

A) 7 pages or fewer
B) 5 pages or fewer
C) 2 pages or fewer
D) 44 pages or fewer

Answer: B

608) Claire has received scores of 85, 88, 87, and 75 on her algebra tests. What score must she receive on the fifth test to have an overall test score average of at least 83?

A) 79 or greater
B) 80 or greater
C) 78 or greater
D) 81 or greater

Answer: B

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609) Using data from 1996–1998, the annual number of cars sold at a certain dealership can be modeled by the formula

$$y = 2x + 2,$$

where y is the number of cars, in thousands, sold x years after 1996. According to this formula, in which years will the number of cars sold exceed 16 thousand?

A) Years after 2,005 B) Years after 2,007 C) Years after 2,003 D) Years after 2,001

Answer: C

610) ABC phone company charges $21 per month plus 3¢ per minute of phone calls. XYZ phone company charges $9 per month plus 5¢ per minute of phone calls. How many minutes of phone calls in a month make XYZ phone company the better deal?

A) More than 60 minutes B) Less than 600 minutes

C) Less than 60 minutes D) More than 600 minutes

Answer: B

611) Greg is opening a car wash. He estimates his cost equation as $C = 7{,}000 + 0.07x$ and his revenue equation as $R = 1.8x$, where x is the number of cars washed in a six–month period. Find the number of cars that must be washed in a six–month period for Greg to make a profit.

A) At least 40,463 cars B) At least 4,047 cars C) At least 405 cars D) At least 3,047 cars

Answer: B

612) A standard train ticket in a certain city costs $2.50 per ride. People who use the train also have the option of purchasing a frequent–rider pass for $15.75 each month. With the pass, a ticket costs only $1.75 per ride. How many train rides in a month make the frequent–rider pass a better deal than standard train tickets?

A) 20 or more rides B) 21 or more rides C) 23 or more rides D) 22 or more rides

Answer: D

613) Every Sunday, Jarod buys a loaf of fresh bread for his family from the corner bakery for $4.00. The local department store has a sale on breadmakers for $61. If the bread–making supplies cost $0.67 per week, for how many weeks would Jarod have to bake a loaf of bread at home before the breadmaker starts saving him money?

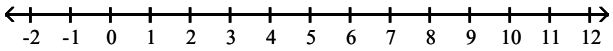
A) At least 21 weeks B) At least 19 weeks C) At least 20 weeks D) At least 18 weeks

Answer: B

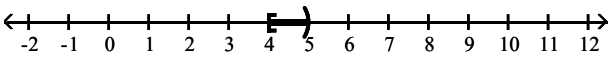
Test Bank for Precalculus 7th Blitzer

Solve the compound inequality. Other than ∅, use interval notation to express the solution set and graph the solution set on a number line.

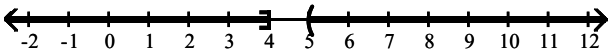
614) $8 < 2x \leq 10$



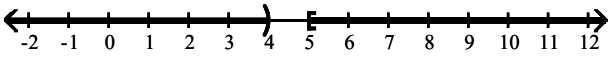
A) [4, 5)



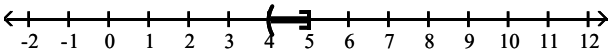
B) $(-\infty, 4] \cup (5, \infty)$



C) $(-\infty, 4) \cup [5, \infty)$

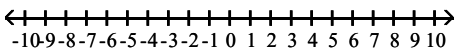


D) (4, 5]

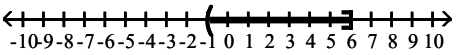


Answer: D

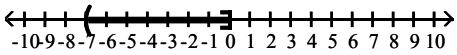
615) $-4 < x + 3 \leq 3$



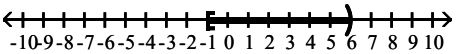
A) (–1, 6]



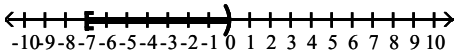
B) (–7, 0]



C) [–1, 6)



D) [–7, 0)



Answer: B

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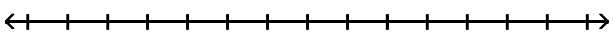
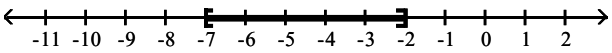
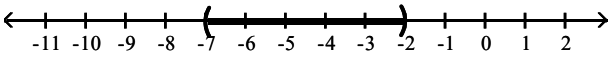
616) $2 \le 3x - 4 \le 17$



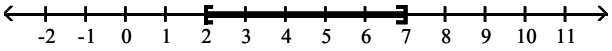
A) [–7, –2]



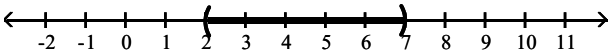
B) (–7, –2)



C) [2, 7]

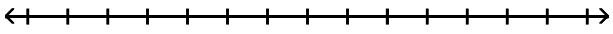


D) (2, 7)

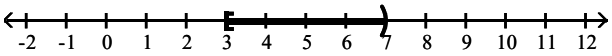


Answer: C

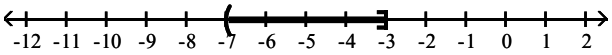
617) $-31 \le -5x + 4 < -11$



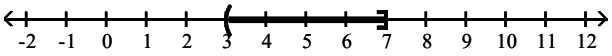
A) [3, 7)



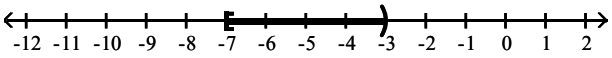
B) (–7, –3]



C) (3, 7]



D) [–7, –3)



Answer: C

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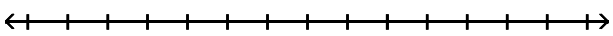
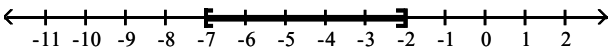
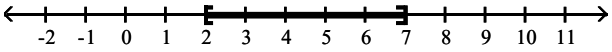
618) $-23 \le -3x - 2 \le -8$



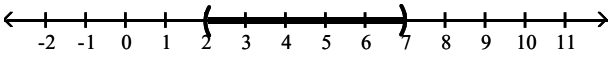
A) [−7, −2]



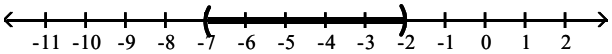
B) [2, 7]



C) (2, 7)

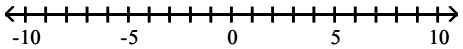


D) (−7, −2)

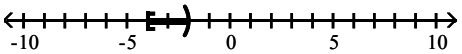


Answer: B

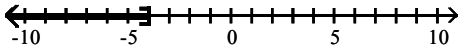
619) $-4 \le -4x - 12 < 4$



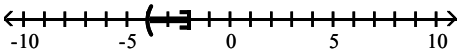
A) [−4, −2)



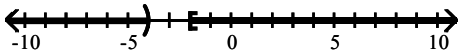
B) (−∞, −4]



C) (−4, −2]

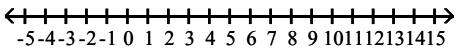


D) (−∞, −4) or [−2, ∞)

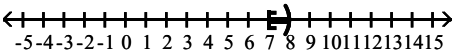


Answer: C

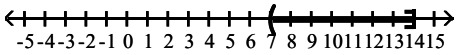
620) $11 \le \frac{6}{7}x + 5 < 17$



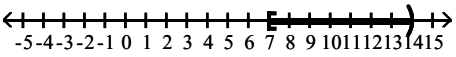
A) [7, 8)



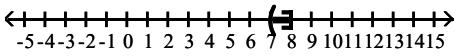
B) (7, 14]



C) [7, 14)



D) (7, 8]



Answer: C

Test Bank for Precalculus 7th Blitzer

Solve the problem.

621) The formula for converting Fahrenheit temperature, F, to Celsius temperature, C, is

$$C = \frac{5}{9}(F - 32).$$

If Celsius temperature ranges from 50° to 100°, inclusive, what is the range for the Fahrenheit temperature?

A) [–12°F, –7°F] B) (122°F, 212°F) C) [122°F, 212°F] D) (–12°F, –7°F)

Answer: C

622) The formula for converting Celsius temperature, C, to Fahrenheit temperature, F, is

$$F = \frac{9}{5}C + 32.$$

If Fahrenheit temperature ranges from 50° to 122°, inclusive, what is the range for the Celsius temperature?

A) (10°C, 50°C) B) (122°C, 252°C)

C) [122°C, 252°C] D) [10°C, 50°C]

Answer: D

623) On the first four exams, your grades are 77, 84, 69, and 78. You are hoping to earn a C in the course. This will occur if the average of your five exam grades is greater than or equal to 70 and less than 80. What range of grades on the fifth exam will result in earning a C?

A) [32, 82) B) (42, 92] C) (32, 82] D) [42, 92)

Answer: D

624) On the first four exams, your grades are 78, 94, 61, and 79. There is still a final exam, and it counts as two grades. You are hoping to earn a C in the course. This will occur if the average of your six exam grades is greater than or equal to 70 and less than 80. What range of grades on the final exam will result in earning a C?

A) [54, 84] B) [54, 84) C) [38, 88] D) [38, 88)

Answer: B

625) Parts for an automobile repair cost $464. The mechanic charges $29 per hour. If you receive an estimate for at least $609 and at most $696 for fixing the car, what is the time interval, in hours, that the mechanic will be working on the job?

A) [21, 24] B) [1, 8] C) [1, 5] D) [5, 8]

Answer: D

626) The formula $C = 0.5x + 20$ represents the estimated future cost of yearly attendance at State University, where C is the cost in thousands of dollars x years after 2002. Use a compound inequality to determine when the attendance costs will range from 24 to 26 thousand dollars.

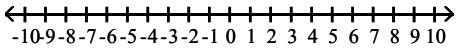
A) From 2,011 to 2,013 B) From 2,010 to 2,014 C) From 2,009 to 2,013 D) From 2,011 to 2,015

Answer: B

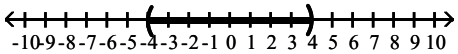
Test Bank for Precalculus 7th Blitzer

Solve the absolute value inequality. Other than ∅, use interval notation to express the solution set and graph the solution set on a number line.

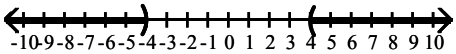
627) $|x| < 4$



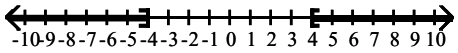
A) $(-4, 4)$



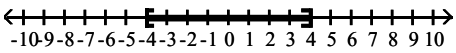
B) $(-\infty, -4) \cup (4, \infty)$



C) $(-\infty, -4] \cup [4, \infty)$

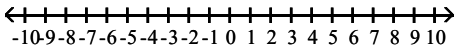


D) $[-4, 4]$

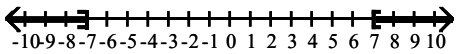


Answer: A

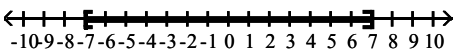
628) $|x| > 7$



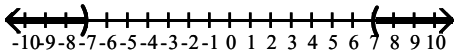
A) $(-\infty, -7] \cup [7, \infty)$



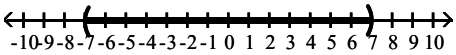
B) $[-7, 7]$



C) $(-\infty, -7) \cup (7, \infty)$

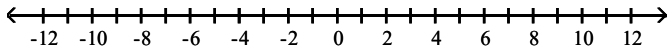


D) $(-7, 7)$

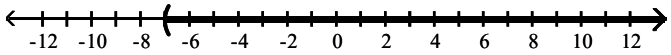


Answer: C

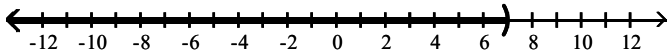
629) $|x - 7| < 0$



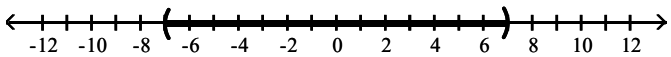
A) $(-7, \infty)$



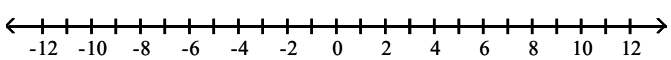
B) $(-\infty, 7)$



C) $(-7, 7)$



D) $\varnothing$



Answer: D

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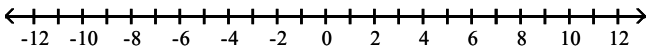
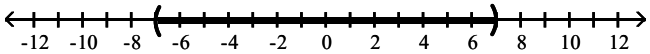
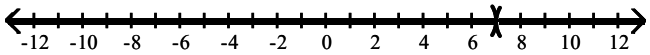
630) $|x - 7| > 0$



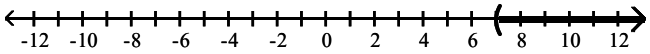
A) (–7, 7)



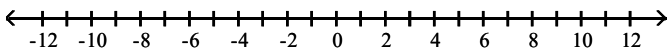
B) (–∞, 7) ∪ (7, ∞)



C) (7, ∞)

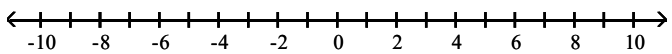


D) ∅

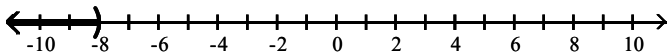


Answer: B

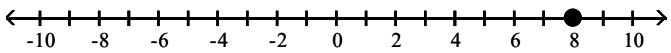
631) $|x + 8| \leq 0$



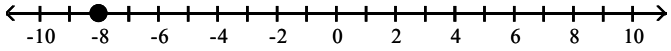
A) (–∞, –8)



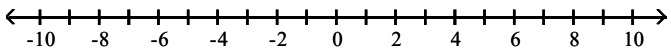
B) {8}



C) {–8}



D) ∅



Answer: C

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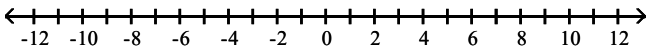
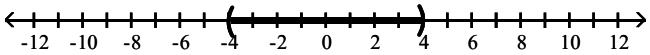
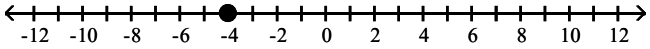
632) $|x + 4| \geq 0$



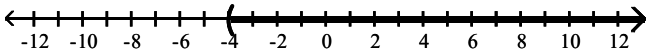
A) (–4, 4)



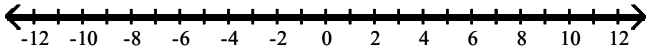
B) {–4}



C) (–4, ∞)

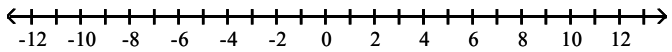


D) (–∞, ∞)

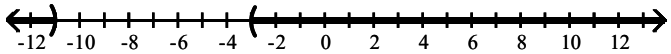


Answer: D

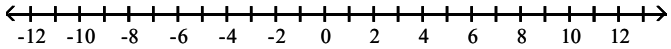
633) $|x + 7| < 4$



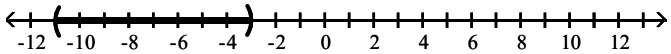
A) (–∞, –11) ∪ (–3, ∞)



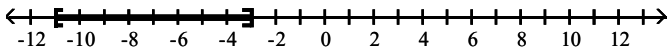
B) ∅



C) (–11, –3)



D) [–11, –3]



Answer: C

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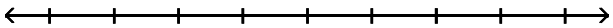
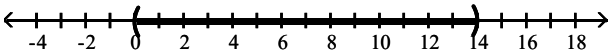
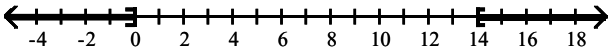
634) $|x - 7| - 6 \le 1$



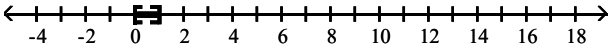
A) (0, 14)



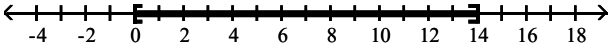
B) $(-\infty, 0] \cup [14, \infty)$



C) [0, 1]

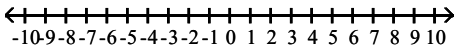


D) [0, 14]

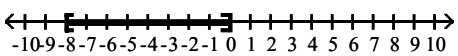


Answer: D

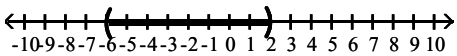
635) $\left| 3(x + 1) + 9 \right| \le 12$



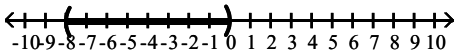
A) [–8, 0]



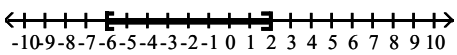
B) (–6, 2)



C) (–8, 0)

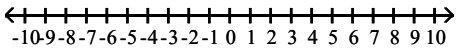


D) [–6, 2]

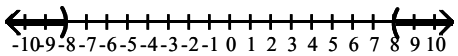


Answer: A

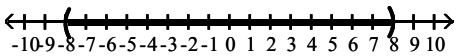
636) $\left| \dfrac{3y + 12}{4} \right| < 3$



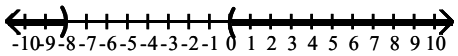
A) $(-\infty, -8) \cup (8, \infty)$



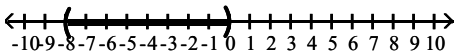
B) (–8, 8)



C) $(-\infty, -8) \cup (0, \infty)$



D) (–8, 0)



Answer: D

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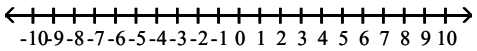
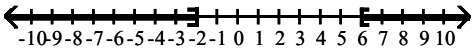
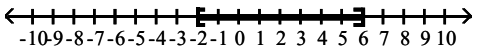
637) $8 + \left|1 - \frac{x}{2}\right| \geq 10$



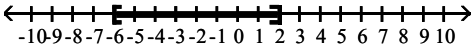
A) $(-\infty, -2] \cup [6, \infty)$



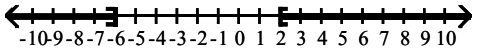
B) $[-2, 6]$



C) $[-6, 2]$

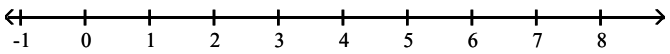


D) $(-\infty, -6] \cup [2, \infty)$

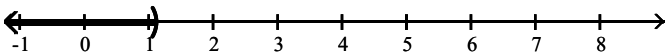


Answer: A

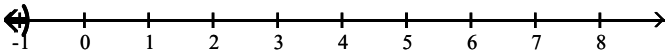
638) $|8x - 1| + 3 < -5$



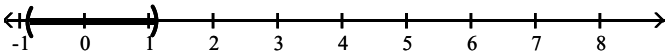
A) $\left(-\infty, \frac{9}{8}\right)$



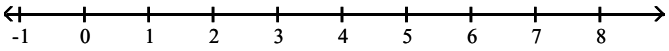
B) $\left(-\infty, -\frac{7}{8}\right)$



C) $\left(-\frac{7}{8}, \frac{9}{8}\right)$



D) $\varnothing$



Answer: D

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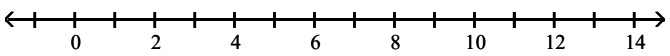
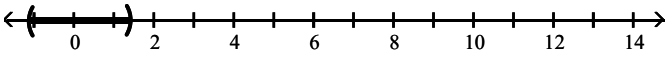
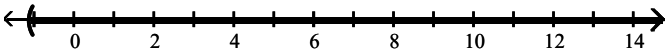
639) $|7x - 1| + 1 > -8$



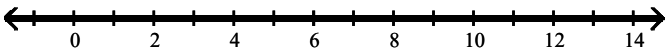
A) $\left(-\frac{8}{7}, \frac{10}{7}\right)$



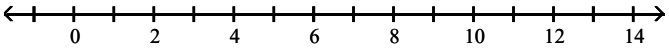
B) $\left(-\frac{8}{7}, \infty\right)$



C) $(-\infty, \infty)$



D) $\varnothing$



Answer: C

Solve the problem.

640) A spinner has ten regions numbered 1 through 10. If the spinner is spun 100 times, we would expect about 10 of the outcomes to be Region 1. It can be determined that the spinner is unbalanced if x, the number of outcomes that result in Region 1, satisfies $\left|\frac{x - 10}{3}\right| \geq 1.645$. Describe the number of outcomes that determine an unbalanced spinner that is spun 100 times.

A) Between 9 and 17 outcomes
B) Fewer than 6 or more than 14 outcomes
C) Fewer than 9 or more than 17 outcomes
D) Between 6 and 14 outcomes

Answer: B

641) When a number is subtracted from –7, the absolute value of the difference is more than 3. Use interval notation to express the set of all numbers that satisfy this condition.

A) $(-\infty, -10) \cup (-4, \infty)$
B) $(-\infty, -10] \cup [-4, \infty)$
C) $(-10, -4)$
D) $(-\infty, -4) \cup (10, \infty)$

Answer: A

642) A landscaping company sells 40–pound bags of top soil. The actual weight x of a bag, however, may differ from the advertised weight by as much as 0.75 pound. Write an inequality involving absolute value that expresses the relationship between the actual weight x of a bag and 40 pounds. Solve the inequality, and express the answer in interval form.

A) $|x| - 40 \leq 0.75$; $(-\infty, 40.75]$
B) $|40 + x| \leq 0.75$; $[39.25, 40.75]$
C) $|x + 0.75| \leq 40$; $[39.25, \infty)$
D) $|40 - x| \leq 0.75$; $[39.25, 40.75]$

Answer: D

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1) B
2) D
3) C
4) B
5) D
6) A
7) C
8) D
9) C
10) C
11) D
12) B
13) D
14) A
15) C
16) B
17) B
18) B
19) A
20) D
21) D
22) B
23) A
24) C
25) B
26) D
27) D
28) B
29) A
30) B
31) A
32) A
33) A
34) A
35) B
36) A
37) B
38) D
39) B
40) B
41) C
42) A
43) A
44) A
45) B
46) C
47) D
48) B
49) A
50) B

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51) C
52) B
53) A
54) B
55) C
56) A
57) C
58) D
59) C
60) A
61) C
62) D
63) D
64) D
65) B
66) C
67) C
68) B
69) B
70) B
71) B
72) D
73) B
74) C
75) B
76) A
77) D
78) C
79) B
80) A
81) A
82) B
83) A
84) D
85) C
86) A
87) C
88) D
89) A
90) D
91) A
92) D
93) B
94) D
95) C
96) D
97) C
98) B
99) D
100) C

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101) C
102) A
103) C
104) C
105) D
106) D
107) B
108) B
109) A
110) B
111) C
112) B
113) D
114) A
115) C
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118) C
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122) C
123) D
124) C
125) D
126) D
127) D
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129) A
130) A
131) C
132) B
133) A
134) D
135) B
136) A
137) B
138) B
139) A
140) B
141) A
142) C
143) B
144) C
145) A
146) A
147) B
148) D
149) D
150) A

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151) B
152) D
153) B
154) D
155) D
156) D
157) C
158) D
159) D
160) C
161) D
162) C
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164) D
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166) D
167) B
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170) B
171) C
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183) D
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188) B
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190) C
191) A
192) B
193) A
194) C
195) B
196) D
197) B
198) C
199) C
200) B

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201) D
202) C
203) B
204) A
205) C
206) D
207) D
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209) A
210) D
211) C
212) A
213) B
214) A
215) C
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217) C
218) A
219) B
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221) B
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223) A
224) D
225) D
226) D
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229) D
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234) C
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237) C
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239) B
240) C
241) C
242) B
243) D
244) D
245) D
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248) B
249) A
250) D

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251) B
252) C
253) D
254) D
255) A
256) D
257) C
258) A
259) B
260) A
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264) D
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266) D
267) D
268) B
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270) D
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273) D
274) C
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279) C
280) B
281) C
282) B
283) A
284) B
285) D
286) C
287) C
288) D
289) C
290) C
291) B
292) A
293) C
294) D
295) A
296) A
297) B
298) D
299) C
300) C

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301) B
302) C
303) C
304) B
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306) B
307) B
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309) A
310) A
311) B
312) D
313) A
314) C
315) C
316) A
317) B
318) C
319) A
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321) D
322) B
323) B
324) C
325) B
326) C
327) D
328) D
329) C
330) C
331) A
332) C
333) C
334) A
335) C
336) B
337) C
338) C
339) D
340) C
341) D
342) C
343) C
344) C
345) D
346) C
347) A
348) D
349) D
350) A

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351) C
352) C
353) C
354) B
355) C
356) D
357) A
358) D
359) C
360) C
361) D
362) B
363) A
364) D
365) D
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370) C
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376) D
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386) B
387) B
388) C
389) A
390) D
391) D
392) D
393) B
394) A
395) D
396) C
397) C
398) C
399) D
400) D

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401) C
402) A
403) B
404) D
405) C
406) A
407) B
408) B
409) C
410) B
411) A
412) B
413) B
414) D
415) B
416) C
417) C
418) D
419) B
420) D
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424) C
425) D
426) A
427) D
428) B
429) D
430) D
431) A
432) A
433) A
434) C
435) C
436) A
437) C
438) D
439) A
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442) D
443) D
444) A
445) D
446) A
447) A
448) D
449) A
450) B

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451) B
452) B
453) B
454) D
455) B
456) D
457) A
458) A
459) B
460) A
461) A
462) A
463) A
464) C
465) B
466) B
467) B
468) D
469) A
470) B
471) D
472) B
473) A
474) A
475) C
476) C
477) B
478) D
479) D
480) D
481) D
482) A
483) A
484) D
485) D
486) A
487) B
488) C
489) D
490) D
491) D
492) B
493) D
494) C
495) A
496) A
497) B
498) A
499) A
500) A

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501) B
502) A
503) C
504) C
505) C
506) D
507) A
508) C
509) A
510) B
511) C
512) A
513) D
514) A
515) C
516) A
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520) D
521) A
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537) B
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545) D
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550) B

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551) C
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554) D
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557) C
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575) B
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578) D
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580) A
581) C
582) A
583) D
584) B
585) C
586) B
587) B
588) D
589) B
590) A
591) C
592) D
593) B
594) A
595) D
596) B
597) A
598) D
599) D
600) B

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601) B
602) D
603) A
604) C
605) C
606) A
607) B
608) B
609) C
610) B
611) B
612) D
613) B
614) D
615) B
616) C
617) C
618) B
619) C
620) C
621) C
622) D
623) D
624) B
625) D
626) B
627) A
628) C
629) D
630) B
631) C
632) D
633) C
634) D
635) A
636) D
637) A
638) D
639) C
640) B
641) A
642) D

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