Test Bank for Precalculus Essentials 6th Edition by Blitzer

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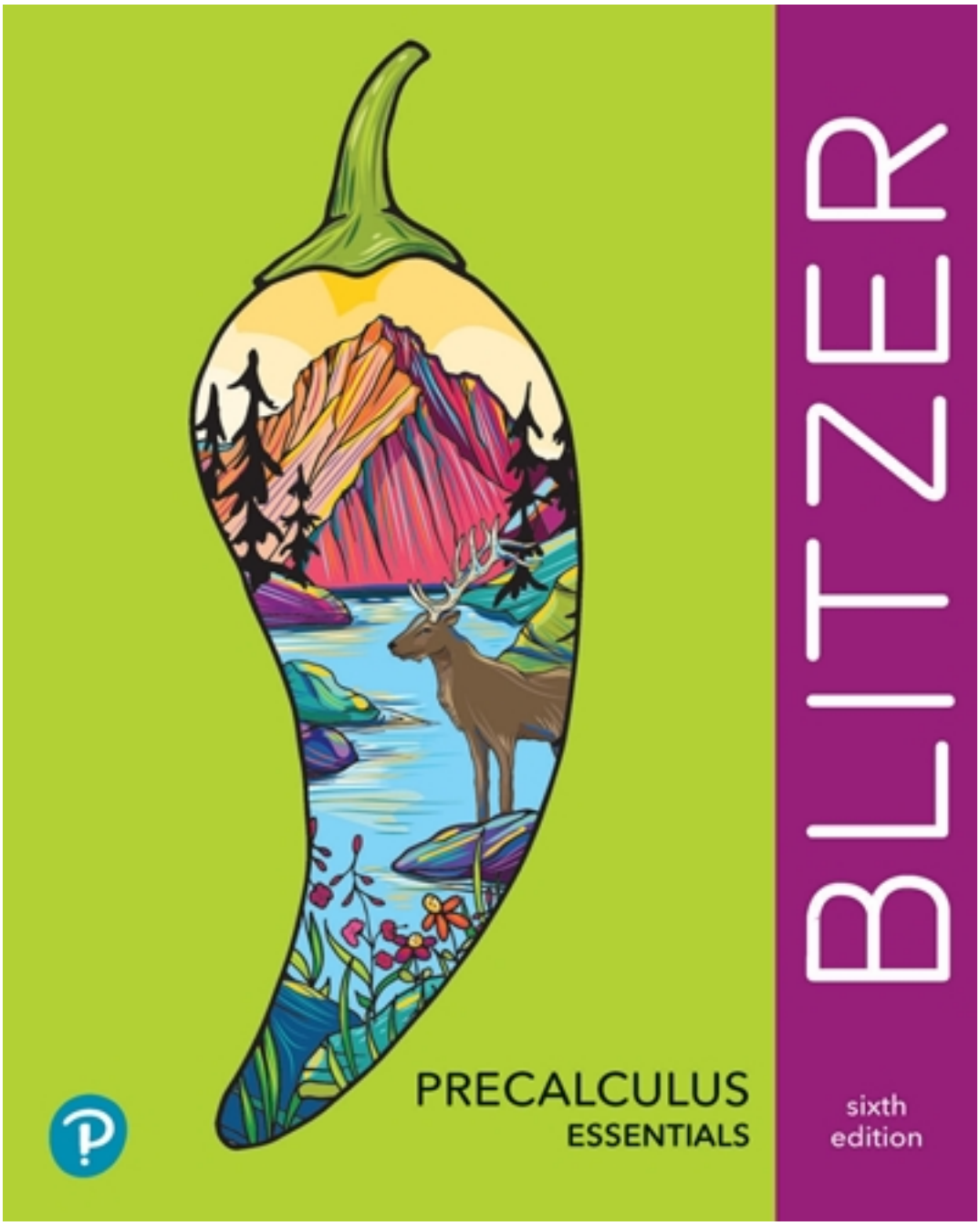


Test Bank

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) 13 B) 51 C) 61 D) 112

Answer: C

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

A) -4 B) 14 C) 4 D) -14

Answer: A

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

A) -13 B) 56 C) -40 D) 13

Answer: A

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

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

Answer: A

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

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

Answer: B

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

A) -42 B) 18 C) 54 D) 96

Answer: C

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

A) 38 B) -82 C) 42 D) 46

Answer: D

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

A) -2 B) -1 C) 6 D) $-\frac{9}{2}$

Answer: B

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

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

Answer: A

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) 130°C B) 40°C C) 76°C D) 8°C

Answer: B

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

Answer: C

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) –36.04 m D) 220.4 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) 85°F B) 138°F C) 552°F D) 78°F

Answer: A

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

Answer: B

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

Answer: C

Find the intersection of the two sets.

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

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

Answer: A

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

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

Answer: C

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

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

Answer: D

Find the union of the two sets.

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

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

Answer: C

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

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

Answer: A

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

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

Answer: C

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

Answer: D

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

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

Answer: D

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

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

Answer: D

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) $\sqrt{7}$, $\sqrt{16}$ D) $\sqrt{7}$, $\frac{1}{2}$, 0.97

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) $\sqrt{8}$ D) $\sqrt{8}$, $0.\overline{2}$

Answer: C

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

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

Answer: C

Determine whether the statement is true or false.

28) $8 > 15$

A) False B) True

Answer: A

29) $10 \geq 3$

A) True B) False

Answer: A

30) $-11 < 0$

A) True B) False

Answer: A

31) $3 < -3$

A) True B) False

Answer: B

32) $10 \leq 8$

A) False B) True

Answer: A

33) $-15 \leq 20$

A) False B) True

Answer: B

34) $21 > 6$

A) True B) False

Answer: A

35) $-18 \geq 21$

A) True B) False

Answer: B

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

A) False B) True

Answer: B

37) $\pi < 3$

A) False B) True

Answer: A

Rewrite the expression without absolute value bars.

38) $|16|$

A) 0 B) 16 C) 32 D) -16

Answer: B

39) $|-13|$

A) -13 B) 26 C) 0 D) 13

Answer: D

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

A) 11 B) –11 C) –1 D) 1

Answer: B

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

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

Answer: C

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

A) –2 B) 2 C) 16 D) –16

Answer: B

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

A) 3 B) 15 C) –15 D) –3

Answer: A

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

A) 3 B) –7 C) –3 D) 7

Answer: D

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

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

A) 2 B) –1 C) 0 D) 1

Answer: C

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

Answer: B

47) –60 and –5

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

Answer: A

48) 54 and –1

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

Answer: A

49) 38.6 and 16.6

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

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

Answer: B

50) –45.6 and 27.8

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

Answer: A

51) 20.8 and 29.6

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

Answer: D

State the name of the property illustrated.

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

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

Answer: C

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

Answer: C

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

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

Answer: D

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

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

Answer: A

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

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

Answer: D

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

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

Answer: A

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

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

Answer: D

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

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

Answer: B

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

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

Answer: D

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

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

Answer: C

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

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

Answer: D

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

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

Answer: C

Simplify the algebraic expression.

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

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

Answer: B

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

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

Answer: D

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

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

Answer: C

Write the algebraic expression without parentheses.

68) $-(75y)$

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

Answer: C

69) $-9(5y)$

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

Answer: A

70) $-(7x - 6)$

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

Answer: C

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

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

Answer: C

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

Answer: D

Evaluate the exponential expression.

74) $2^3 \cdot 7$

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

Answer: B

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) 1 C) 0 D) 5

Answer: B

78) $(-9)^0$

A) –1 B) 9 C) 1 D) 0

Answer: C

79) -10^0

A) 10 B) –1 C) 0 D) 1

Answer: B

80) 3^{-2}

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

Answer: D

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

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

Answer: A

82) -2^{-3}

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

Answer: C

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

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

Answer: C

84) $(2^4)^3$

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

Answer: D

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

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

Answer: C

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

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

Answer: B

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

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

Answer: D

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

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

Answer: B

Simplify the exponential expression.

89) $y \cdot y^6$

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

Answer: C

90) $x^{-8}y$

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

Answer: D

91) x^7y^0

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

Answer: C

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

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

Answer: D

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

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

Answer: D

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

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

Answer: D

95) $(x^3)^5$

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

Answer: D

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

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

Answer: A

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

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

Answer: A

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

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

Answer: C

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

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

Answer: B

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

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

Answer: A

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

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

Answer: D

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

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

Answer: B

103) $(2x)^5$

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

Answer: A

104) $(-2x)^5$

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

Answer: B

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

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

Answer: B

106) $-5y^0$

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

Answer: A

107) $(7b)^0$

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

Answer: B

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

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

Answer: A

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

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

Answer: C

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

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

Answer: B

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

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

Answer: C

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

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

Answer: A

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

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

Answer: A

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

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

Answer: B

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

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

Answer: D

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

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

Answer: D

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

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

Answer: A

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

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

Answer: B

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

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

Answer: D

120) x^2y^{-3}

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

Answer: B

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

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

Answer: D

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

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

Answer: D

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

A) $4xy^5$ B) $20xy^{15}$ C) $4x^{15}y^{15}$ 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) 0 B) x^8y^8 C) $9x^8y^8$ D) 1

Answer: D

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

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

Answer: D

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

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

Answer: C

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

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

Answer: D

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

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

Answer: D

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

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

Answer: C

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

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

Answer: A

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

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

Answer: A

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

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

Answer: B

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

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

Answer: D

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

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

Answer: B

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

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

Answer: B

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) $\frac{1}{x^{14}y^{12}}$

Answer: B

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

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

Answer: C

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

139) 7×10^{-2}

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

Answer: B

140) 7×10^{-3}

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

Answer: C

141) 6.19×10^3

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

Answer: A

142) 2.17×10^{-4}

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

Answer: B

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) –1,170,000 C) –11,700,000 D) –117,000

Answer: B

145) -8.5961×10^{6}

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

Answer: D

Write the number in scientific notation.

146) 337

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

Answer: C

147) 36,000

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

Answer: C

148) 77,000,000

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

Answer: D

149) 77,477

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

Answer: B

150) 0.000169

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

Answer: A

151) 0.00006773

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

Answer: C

152) 0.0000000862018

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

Answer: D

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

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

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

Answer: C

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

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

Answer: D

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

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

Answer: D

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

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

Answer: A

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

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

Answer: B

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

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

Answer: A

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

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

Answer: C

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

Answer: A

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

Answer: B

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

162) $\sqrt{4}$

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

Answer: A

163) $-\sqrt{361}$

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

Answer: C

164) $\sqrt{-144}$

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

Answer: D

165) $\sqrt{64 + 36}$

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

Answer: D

166) $\sqrt{169 - 25}$

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

Answer: B

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

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

Answer: C

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

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

Answer: B

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

A) −4 B) 4 C) 16 D) Not a real number

Answer: B

Use the product rule to simplify the expression.

170) $\sqrt{147}$

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

Answer: D

171) $\sqrt{10}$

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

Answer: A

172) $\sqrt{275}$

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

Answer: D

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

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

Answer: C

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

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

Answer: A

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

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

Answer: D

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

A) $14|x|\sqrt{2}$ B) $14x^2\sqrt{2x}$ C) $14|x|\sqrt{2x^2}$ 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) $16\sqrt{2}$ miles per hour B) $16 + \sqrt{2}$ miles per hour

C) $\frac{4(4 + \sqrt{2})}{x}$ miles per hour D) $12\sqrt{2}$ miles per hour

Answer: D

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

Answer: D

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

Answer: A

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

Answer: D

Use the quotient rule to simplify the expression.

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

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

Answer: C

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

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

Answer: A

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

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

Answer: B

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

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

Answer: A

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) $\frac{\sqrt{66}}{4}$ seconds D) $\frac{8+\sqrt{2}}{4}$ seconds

Answer: C

Add or subtract terms whenever possible.

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

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

Answer: A

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

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

Answer: C

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

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

Answer: A

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

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

Answer: B

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

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

Answer: A

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

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

C) $\sqrt{147} + \sqrt{108} + 23$ D) $13\sqrt{3} + \sqrt{144} + \sqrt{121}$

Answer: A

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

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

Answer: D

Rationalize the denominator.

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

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

Answer: D

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

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

Answer: D

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

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

Answer: B

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

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

Answer: A

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

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

Answer: D

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

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

Answer: C

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

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

Answer: A

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

Answer: A

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: B

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

A) –4 B) 4 C) 64 D) not a real number

Answer: B

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

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

Answer: B

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

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

Answer: A

Simplify the radical expression.

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

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

Answer: B

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

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

Answer: C

Add or subtract terms whenever possible.

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

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

Answer: C

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

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

Answer: B

Evaluate the expression without using a calculator.

210) $121^{1/2}$

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

Answer: D

211) $81^{1/4}$

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

Answer: D

212) $27^{4/3}$

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

Answer: D

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

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

Answer: A

Simplify using properties of exponents.

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

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

Answer: A

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

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

Answer: B

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

Answer: D

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

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

Answer: B

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

Answer: C

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

Answer: B

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

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

Answer: B

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

A) No

B) Yes; $\frac{5}{x} - 3$

Answer: A

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

A) No

B) Yes; $x^4 - x^3 + x^2 + 8$

Answer: B

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

Answer: A

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

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

Answer: D

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

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

Answer: C

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

Answer: A

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

A) $2x^4 + 2x^3 + 4x^2 + 11$

B) $12x^4 + 12x^3 - 6x^2 - 7$

C) $12x^8 + 12x^6 - 6x^4 - 7$

D) $18x^{18} - 7$

Answer: B

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

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

Answer: A

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

A) $7x^7 + 2x^6 - 3x^5 + 10$

B) $3x^7 - 8x^6 - 15x^5 - 2$

C) $7x^7 + 2x^6 - 3x^5 - 2$

D) $3x^7 + 2x^6 - 3x^5 + 10$

Answer: B

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

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

Answer: C

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

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

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

Answer: C

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

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

Answer: D

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

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

Answer: B

Find the product.

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

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

Answer: D

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

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

Answer: D

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

A) $x^3 + 15x^2 + 61x - 63$ B) $x^3 + 15x^2 + 47x - 63$

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

Answer: B

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

A) $270x^4 + 5x^3 + 216x^2 + 36$ B) $5x^3 + 45x^2 + 54x + 36$

C) $50x^3 + 60x^2 + 40x$ D) $5x^3 + 51x^2 + 58x + 36$

Answer: D

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

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

Answer: D

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

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

Answer: B

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

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

Answer: B

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

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

Answer: D

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

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

Answer: C

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

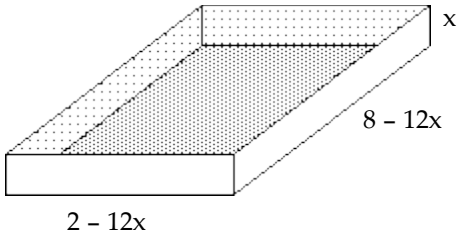
A) $7x^5 + 24x^3 - 16$ B) $7x^6 + 28x^3 - 4x^2 - 16$

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

Answer: C

Solve the problem.

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

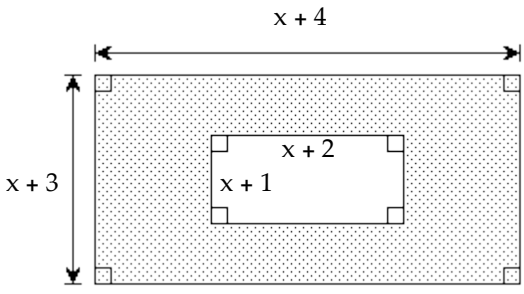


A) $144x^3 + 120x^2 + 16x$ B) $144x^2 - 120x + 16$

C) $144x^3 - 120x^2 + 16x$ D) $12x^3 - 120x^2 + 16x$

Answer: C

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



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

Answer: B

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

Answer: C

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

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

Answer: B

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) $25x^4 - 40x^3 - 16x^2$

Answer: C

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

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

Answer: B

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

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

Answer: A

254) $(x + 14)^2$

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

Answer: B

255) $(x - 7)^2$

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

Answer: D

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

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

Answer: C

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

Answer: D

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: D

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

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

Answer: D

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

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

Answer: B

262) $(x - 4)^3$

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

Answer: A

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

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

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

Answer: B

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

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

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

Answer: D

Perform the indicated operations.

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

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

Answer: A

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

A) $17x^2y + 14xy + 9$ B) $-x^2y - 14xy + 9$ C) $6x^3y^2 + 3$ 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) $14x^4y^2 + 19x^2y^2 + 18xy$

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

Answer: A

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

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

Answer: A

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

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

Answer: C

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

Answer: B

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

Answer: C

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

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

Answer: D

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

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

Answer: D

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

A) $7x^2 + 81y^2$ B) $7x^2 - 126xy + 81y^2$

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

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

Answer: A

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

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

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

Answer: B

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

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

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

Answer: B

Factor out the greatest common factor.

280) $4x + 20$

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

Answer: A

281) $4x^2 - 28x$

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

Answer: A

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

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

Answer: A

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

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

Answer: C

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

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

Answer: A

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

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

Answer: A

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: D

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

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

Answer: A

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

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: A

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

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

Answer: B

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

A) $(x - 5)(x - 9)$ B) $(x + 5)(x - 9)$ C) $(x - 5)(x + 1)$ 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) $(x + 8)(x - 7)$ B) $(x + 7)(x - 8)$ C) $(x + 1)(x - 15)$ D) prime

Answer: B

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

Answer: B

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

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

Answer: C

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

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

Answer: C

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

Answer: C

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: C

302) $x^2 - 11xy + 24y^2$
A) $(x + 3y)(x - 8y)$ B) $(x + 3y)(x + y)$ 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) $(2x + 9y)(x - 3y)$ B) $y(2x + 9)(x - 3)$ C) $(2x + 3y)(x - 9y)$ D) prime
Answer: A

305) $9x^2 + 6xy - 8y^2$
A) $(9x - 2y)(x + 4y)$ B) $(3x + 2y)(3x - 4y)$ C) $(3x - 2y)(3x + 4y)$ D) prime
Answer: C

Factor the difference of two squares.

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

307) $9x^2 - 49$
A) $(3x + 7)(3x - 7)$ B) $(3x + 7)^2$ C) $(3x - 7)^2$ D) prime
Answer: A

308) $49x^2 - 169y^2$
A) $(7x + 13y)^2$ B) $(7x - 13y)^2$ C) $(7x + 13y)(7x - 13y)$ D) prime
Answer: C

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
Answer: B

310) $(16x^4 - 81)$
A) $(4x^2 + 9)(4x^2 - 9)$ B) $(2x + 3)^2(2x - 3)^2$
C) $(4x^2 + 9)(4x^2 + 9)$ D) $(4x^2 + 9)(2x + 3)(2x - 3)$
Answer: D

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

Answer: C

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

Answer: B

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

314) $x^3 - 27$

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

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

Answer: C

315) $x^3 + 64$

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

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

Answer: B

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: B

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: C

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: D

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: C

Factor completely, or state that the polynomial is prime.

320) $11x^3 - 44x$

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

Answer: A

321) $12x^2 - 147$

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

Answer: D

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

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

Answer: D

323) $4x^4 - 4$

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

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

Answer: B

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

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

Answer: B

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

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

Answer: C

326) $x^3 - 16x$

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

Answer: B

327) $25x^3 - 25x$

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

Answer: C

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

Answer: C

330) $2x^3 + 16$

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

Answer: B

331) $y^5 - 256y$

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

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

Answer: C

332) $4x^5 - 4x$

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

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

Answer: C

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

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

Answer: B

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

Answer: C

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: B

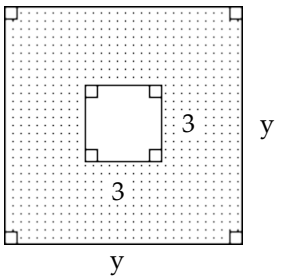
Solve the problem.

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

Answer: D

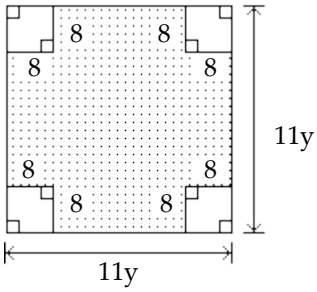
339) Write an expression for the area of the shaded region and express it in factored form.



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

Answer: C

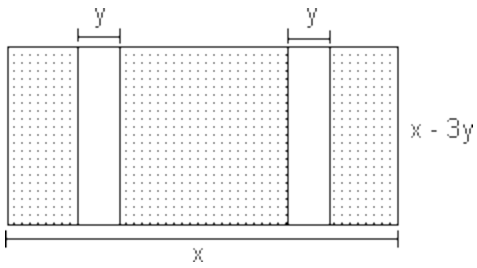
340) Write an expression for the area of the shaded region and express it in factored form.



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

Answer: D

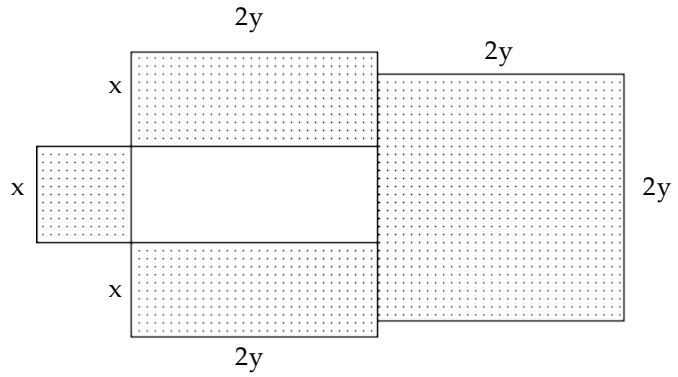
341) Write an expression for the area of the shaded region and express it in factored form.



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

Answer: C

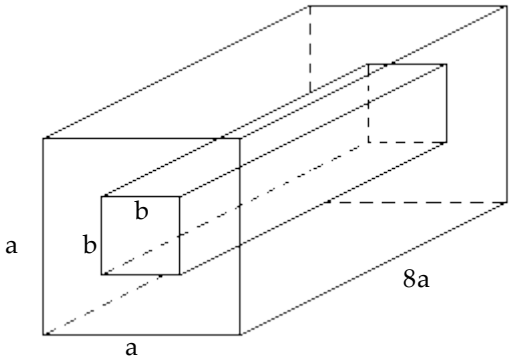
342) Write an expression for the area of the shaded region and express it in factored form.



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

Answer: D

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

Answer: A

Factor and simplify the algebraic expression.

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

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

Answer: A

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

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

Answer: B

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

A) $(x + 5)^{1/2}\,(1 + (x + 5)^{1/4})$ B) $(x + 5)^{1/2}\,((x + 5)^{1/2} + 1)$

C) $(x + 5)^{1/4}\,(1 + (x + 5)^{1/2})$ D) $(x + 5)^{1/2}\,(1 + (x + 5)^{3/2})$

Answer: C

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

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

Answer: D

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

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

Answer: C

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

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

Answer: B

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

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

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

Answer: B

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

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

Answer: A

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

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

Answer: B

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

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

Answer: A

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

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

Answer: C

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

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

Answer: A

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

A) $x \neq -5, x \neq -7$ B) $x \neq 0$ C) $x \neq -7$ 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) $\frac{4x + 3}{20x^2 + 23x + 6}, x \neq -\frac{2}{5}, x \neq -\frac{3}{4}$

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

C) $\frac{4x + 5}{5x + 23}, x \neq -\frac{23}{5}$

D) $\frac{4x}{5x + 2}, x \neq -\frac{2}{5}$

Answer: B

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

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

B) $\frac{x + 5}{x + 6}, x \neq -6, -7$

C) $\frac{12x + 5}{13x + 6}, x \neq -\frac{6}{13}$

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

Answer: B

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

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

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

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

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

Answer: C

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

Answer: A

Multiply or divide as indicated.

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

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

Answer: D

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

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

Answer: D

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

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

Answer: D

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

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

Answer: B

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

Answer: A

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

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

Answer: D

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

Answer: C

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

A) $\frac{x + 4}{x + 3}$ B) $\frac{x + 2}{x + 4}$ 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) $\frac{(x + 10)(x + 2)}{(x + 12)(x + 7)}$ 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) $\frac{(x - 10)}{(x - 7)}$

Answer: C

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

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

Answer: D

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

Answer: C

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

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

Answer: A

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

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

Answer: B

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

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

Answer: D

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

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

Answer: C

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

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

Answer: A

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

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

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

Answer: C

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

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

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

Answer: A

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

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

Answer: B

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

A) $\frac{6x - 48}{x - 16}$ B) 6 C) $6x$ D) $\frac{1}{6}$

Answer: B

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) $\frac{2(x - 5)}{(x + 5)(x - 2)}$ B) $\frac{2}{x - 2}$ C) $\frac{2}{x - 5}$ D) $\frac{2(x + 5)}{(x - 5)(x - 2)}$

Answer: B

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) $\frac{1}{x - 9}$ D) $\frac{1}{x^2 - 11x + 18}$

Answer: C

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) $\frac{3x - 9}{(x + 3)(x - 3)}$ B) $\frac{3}{(x + 3)(x - 3)}$ C) $\frac{3x + 21}{(x + 3)(x - 3)}$ D) $\frac{3x - 21}{(x + 3)(x - 3)}$

Answer: D

390) $\frac{5}{x - 8} + \frac{25}{8 - x}$

A) $-\frac{30}{x - 8}$ B) $-\frac{20}{x - 8}$ C) $\frac{30}{x - 8}$ D) $\frac{20}{x - 8}$

Answer: B

391) $\frac{11}{x - 4} - \frac{3}{4 - x}$

A) $\frac{8}{x - 4}$ B) $\frac{56 - 14x}{(x - 4)(4 - x)}$ C) $\frac{14}{4 - x}$ D) $\frac{14}{x - 4}$

Answer: D

392) $\frac{4}{x^2 - 3x + 2} + \frac{5}{x^2 - 1}$

A) $\frac{9x - 6}{(x - 1)(x + 1)(x - 2)}$ B) $\frac{9x - 6}{(x - 1)(x - 2)}$ C) $\frac{40x - 6}{(x - 1)(x + 1)(x - 2)}$ D) $\frac{6x - 9}{(x - 1)(x + 1)(x - 2)}$

Answer: A

393) $\frac{x}{x^2 - 16} - \frac{5}{x^2 + 5x + 4}$

A) $\frac{x^2 - 4x + 20}{(x - 4)(x + 4)}$ B) $\frac{x^2 - 4}{(x - 4)(x + 4)(x + 1)}$ C) $\frac{x^2 + 4x + 20}{(x - 4)(x + 4)(x + 1)}$ D) $\frac{x^2 - 4x + 20}{(x - 4)(x + 4)(x + 1)}$

Answer: D

394) $\frac{x+3}{x^2+3x-40}+\frac{3x+5}{x^2+6x-16}$

A) $\frac{4x+8}{2x^2+9x-56}$ B) $\frac{4x^2-9x-31}{(x+8)(x-5)(x-2)}$ C) $4x+8$ D) $\frac{4x^2-9x-31}{(x-8)(x+5)(x+2)}$

Answer: B

395) $\frac{6x}{x+1}+\frac{7}{x-1}-\frac{12}{x^2-1}$

A) $\frac{x+1}{x-1}$ B) $\frac{6x}{x-1}$ C) $\frac{6x-5}{x-1}$ D) $\frac{6x-5}{x+1}$

Answer: C

Solve the problem.

396) Doctors use the rational expression

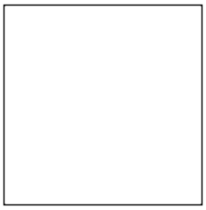
$$\frac{DA}{A+12}$$

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) $\frac{1}{6}D$ C) $27D$ D) $\frac{1}{10}D$

Answer: D

397) Express the perimeter of the square as a single rational expression.



$\frac{11}{x+4}$

A) $\frac{44}{x+4}$ B) $\frac{44}{x+8}$ C) $\frac{11}{x+16}$ D) $\frac{44}{x+16}$

Answer: A

398) Express the perimeter of the rectangle as a single rational expression.

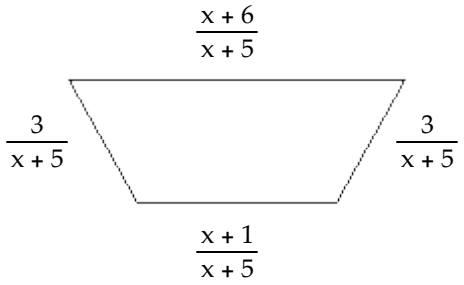
$\frac{9}{x-6}$

$\frac{4}{x}$

A) $\frac{13x-24}{x(6-x)}$ B) $\frac{13x-24}{x(x-6)}$ C) $\frac{26x-48}{x(6-x)}$ D) $\frac{26x-48}{x(x-6)}$

Answer: D

399) Express the perimeter of the trapezoid as a single rational expression.



A) $\frac{4x+13}{x+5}$ B) $\frac{2x+13}{x+5}$ C) $\frac{x+13}{x+5}$ D) $x+8$

Answer: B

Simplify the complex rational expression.

400) $\frac{\frac{x}{10}-1}{x-10}$

A) $x-10$ B) -10 C) $\frac{10}{x-10}$ D) $\frac{1}{10}$

Answer: D

401) $\frac{1-\frac{2}{x}}{1+\frac{2}{x}}$

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

Answer: D

402) $\frac{\frac{7}{x}+1}{\frac{7}{x}-1}$

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

Answer: A

403) $\frac{1-\frac{1}{x}}{2+\frac{1}{x}}$

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

Answer: A

404) $\dfrac{9+\dfrac{3}{x}}{\dfrac{x}{4}+\dfrac{1}{12}}$

A) $\dfrac{36}{x}$ B) 1 C) $\dfrac{x}{36}$ D) 36

Answer: A

405) $\dfrac{x-\dfrac{x}{x+6}}{x+5}$

A) $\dfrac{x^2}{x+6}$ B) $\dfrac{x}{x+5}$ 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) $\dfrac{x-4}{x-2}$ C) $\dfrac{2x-8}{x-2}$ D) $\dfrac{2x-8}{x+2}$

Answer: C

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) $\dfrac{2+9x}{9x}$

Answer: A

408) $\dfrac{\dfrac{1}{x+2}}{\dfrac{3}{x^2-4}}$

A) $\dfrac{x+2}{3}$ B) $\dfrac{3}{x-2}$ C) $\dfrac{x-2}{3}$ D) $x-2$

Answer: C

409) $\dfrac{\dfrac{36y^2 - 64x^2}{xy}}{\dfrac{6}{x} - \dfrac{8}{y}}$

A) $\dfrac{xy}{6x + 8y}$ B) $6x + 8y$ C) $\dfrac{8x + 6y}{xy}$ D) $8x + 6y$

Answer: D

410) $\dfrac{\dfrac{3}{x^2 - 3x - 18} - \dfrac{1}{x - 6}}{\dfrac{1}{x + 3} + 1}$

A) $-\dfrac{x}{x^2 - 2x - 24}$ B) $-\dfrac{x}{x^2 - 3x - 18}$ C) -1 D) $\dfrac{x}{x^2 - 4x - 24}$

Answer: A

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 lower than Michael's.
B) Not enough information is given to answer the question.
C) Fred's average speed is higher than Michael's.
D) Fred's average speed is the same as Michael's.

Answer: D

Simplify the expression.

412) $\dfrac{\sqrt{x} - \dfrac{1}{3\sqrt{x}}}{\sqrt{x}}$

A) $1 - \dfrac{1}{3}$ B) $x^2 - \dfrac{1}{3x}$ C) $\dfrac{\sqrt{x} - \dfrac{1}{3\sqrt{x}}}{\sqrt{x}}$ D) $1 - \dfrac{1}{3x}$

Answer: D

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) $\dfrac{7}{x^2\sqrt{x^2+7}}$ C) $\dfrac{\dfrac{x^2}{\sqrt{x^2+7}} - \sqrt{x^2+7}}{x^2}$ D) $\dfrac{-7}{x^2\sqrt{x^2+7}}$

Answer: D

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) $\dfrac{4}{(4-x^2)^{3/2}}$

Answer: D

415) $\dfrac{\dfrac{1}{\sqrt{x+3}} - \dfrac{1}{\sqrt{x}}}{3}$

A) $\dfrac{1}{3\sqrt{x+3}} - \dfrac{1}{3\sqrt{x}}$ B) $\dfrac{\dfrac{1}{\sqrt{x+3}} - \dfrac{1}{\sqrt{x}}}{3}$ C) $\dfrac{\sqrt{3}}{3\sqrt{x}\sqrt{x+3}}$ D) $\dfrac{1}{3}$

Answer: A

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) $\dfrac{2\sqrt{x+8}}{8\sqrt{x+8} + \sqrt{x}}$ D) $\dfrac{1}{\sqrt{x+8} + \sqrt{x}}$

Answer: D

417) $\dfrac{\sqrt{x} - \sqrt{y}}{x^2 - y^2}$

A) $\dfrac{1}{(x+y)(\sqrt{x}+\sqrt{y})}$ B) $\dfrac{1}{x+y}$ C) $\dfrac{x^2-y^2}{x^2+y^2}$ D) $\dfrac{1}{(x+y)(\sqrt{x}-\sqrt{y})}$

Answer: A

Solve the linear equation.

418) $8x - 6 = 74$

A) {10} B) {15} C) {72} D) {76}

Answer: A

419) $8x - (6x - 1) = 2$

A) $\left\{\frac{1}{14}\right\}$ B) $\left\{-\frac{1}{14}\right\}$ C) $\left\{-\frac{1}{2}\right\}$ D) $\left\{\frac{1}{2}\right\}$

Answer: D

420) $10a + 2 = 9a + 8$

A) {6} B) {10} C) {−6} D) {−10}

Answer: A

421) $27t - 3 = 7t + 13$

A) $\{17\}$ B) $\left\{\frac{4}{5}\right\}$ C) $\left\{\frac{27}{10}\right\}$ D) $\left\{-\frac{4}{5}\right\}$

Answer: B

422) $7x - 8 = 5 - 4x$

A) $\left\{-\frac{11}{13}\right\}$ B) $\left\{\frac{13}{11}\right\}$ C) $\left\{\frac{11}{13}\right\}$ D) $\{-1\}$

Answer: B

423) $2x - 7 = 3(x + 2)$

A) {1} B) {−13} C) {13} D) {−1}

Answer: B

424) $5(x + 4) + 7 = 4(x + 5) + 6$

A) {17} B) {−1} C) {9} D) {13}

Answer: B

425) $-18 - (3y + 2) = 2(y + 2) + 3y$

A) $\left\{-\frac{1}{3}\right\}$ B) $\{-12\}$ C) $\left\{-\frac{9}{4}\right\}$ D) {−3}

Answer: D

426) $8y + 4(1 + y) = 3(y - 8) + 10y$

A) {−28} B) {28} C) {9} D) {−9}

Answer: B

427) $(-3x - 9) - 2 = -2(x + 6)$

A) {− 5} B) {− 1} C) {17} D) {1}

Answer: D

428) $6x - 6 + 7(x + 1) = 6x - 5$

A) $\left\{-\frac{6}{7}\right\}$ B) $\left\{-\frac{18}{7}\right\}$ C) $\{-1\}$ D) $\{-3\}$

Answer: A

429) $-6[6x + 5 + 4(x + 1)] = -5x - 1$

A) $\left\{-\frac{53}{55}\right\}$ B) $\left\{-\frac{7}{6}\right\}$ C) $\left\{\frac{7}{55}\right\}$ D) $\left\{\frac{53}{6}\right\}$

Answer: A

430) $\frac{x}{6} = \frac{x}{9} + 8$

A) {72} B) $\{144\}$ C) {48} D) {54}

Answer: B

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) {–6} C) {0} D) {–2}

Answer: A

433) $\frac{x+3}{6} - 1 = \frac{x-3}{5}$

A) $\{3\}$ B) $\{-33\}$ C) $\left\{\frac{3}{11}\right\}$ D) $\{32\}$

Answer: A

434) $55 - \frac{x}{4} = \frac{x}{7}$

A) {140} B) $\left\{\frac{605}{2}\right\}$ C) {5} D) $\left\{\frac{605}{28}\right\}$

Answer: A

435) $\frac{2x}{5} = \frac{x}{3} + 3$

A) {90} B) {–90} C) {45} D) {–45}

Answer: C

436) $\frac{8x}{9} - x = \frac{x}{63} - \frac{4}{7}$

A) $\{-6\}$ B) $\left\{\frac{9}{2}\right\}$ C) $\{6\}$ D) $\left\{-\frac{9}{2}\right\}$

Answer: B

437) $\frac{x+8}{3} = \frac{14}{5} - \frac{x-2}{5}$

A) {42} B) {1} C) $\{18\}$ D) {0}

Answer: B

438) $\frac{x+16}{8}+\frac{x+8}{8}=x+8$

A) $\{-12\}$ B) $\left\{-\frac{20}{3}\right\}$ C) $\left\{-\frac{28}{3}\right\}$ D) $\left\{-\frac{44}{3}\right\}$

Answer: B

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; {10} B) 0, 2; $\left\{\frac{13}{22}\right\}$ C) none; {5} D) 0; $\left\{\frac{1}{10}\right\}$

Answer: D

440) $\frac{2}{x}+8=\frac{5}{2x}+\frac{16}{3}$

A) 0; $\left\{\frac{3}{16}\right\}$ B) none; $\left\{\frac{16}{3}\right\}$ C) 0, 2, 3; $\left\{\frac{3}{16}\right\}$ D) 0; $\left\{\frac{16}{3}\right\}$

Answer: A

441) $\frac{x-9}{3x}+7=\frac{x+5}{x}$

A) 0; $\left\{-\frac{17}{2}\right\}$ B) 0; $\left\{\frac{24}{19}\right\}$ C) none; $\left\{\frac{2}{3}\right\}$ D) 0, 3; $\left\{\frac{24}{19}\right\}$

Answer: B

442) $\frac{6}{x-3}+3=\frac{12}{x-3}$

A) –3; {9} B) 3; ∅ C) –3; {5} D) 3; {5}

Answer: D

443) $\frac{20}{4x-4}+\frac{1}{4}=\frac{5}{x-1}$

A) 1; {1} B) 1; ∅ C) –1, 4; {1, 4} D) 4; {1}

Answer: B

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}

Answer: A

Solve the rational equation.

445) $\frac{x}{x-8}-6=\frac{8}{x-8}$

A) ∅ B) {–8, 8} C) {–8} D) {8}

Answer: A

446) $\frac{4}{x-1}+\frac{4}{2x-2}=6$

A) {1} B) {0} C) {2} D) {24}

Answer: C

447) $\frac{2}{x-5}+\frac{8}{5-x}=\frac{8}{x+3}$

A) $\{5\}$ B) $\left\{-\frac{11}{7}\right\}$ C) $\left\{\frac{11}{7}\right\}$ D) $\left\{\frac{11}{9}\right\}$

Answer: C

448) $\frac{x}{2x+2}=\frac{2x-3}{x+1}-\frac{2x}{4x+4}$

A) {–3} B) {3} C) $\left\{-\frac{12}{5}\right\}$ D) $\left\{\frac{3}{2}\right\}$

Answer: B

449) $\frac{9}{y+3}-\frac{7}{y-3}=\frac{8}{y^2-9}$

A) {–28} B) $\{\sqrt{64}\}$ C) {56} D) {28}

Answer: D

450) $\frac{1}{x+5}+\frac{3}{x+4}=\frac{-1}{x^2+9x+20}$

A) {–5} B) {0} C) {4} D) ∅

Answer: D

451) $\frac{m+3}{m^2+9m+20}-\frac{3}{m^2+8m+16}=\frac{m-3}{m^2+9m+20}$

A) {–9} B) {18} C) {3} D) {–3}

Answer: D

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) 200 units B) 108 units C) 217 units D) 215 units

Answer: D

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) 94.0% B) 608.7% C) 106.9% D) 9.4%

Answer: A

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) 9 thousand tons D) 186 thousand tons

Answer: A

Solve the formula for the specified variable.

455) $A = \frac{1}{2}bh$ for b

A) $b = \frac{Ah}{2}$ B) $b = \frac{h}{2A}$ C) $b = \frac{A}{2h}$ D) $b = \frac{2A}{h}$

Answer: D

456) $S = 2\pi rh + 2\pi r^2$ for h

A) $h = \frac{S}{2\pi r} - 1$ B) $h = 2\pi(S - r)$ C) $h = S - r$ 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) $C = \frac{9}{5}(F - 32)$ B) $C = \frac{5}{9}(F - 32)$ C) $C = \frac{F - 32}{9}$ D) $C = \frac{5}{F - 32}$

Answer: B

459) $A = \frac{1}{2}h(a + b)$ for a

A) $a = \frac{hb - 2A}{h}$ B) $a = \frac{A - hb}{2h}$ C) $a = \frac{2A - hb}{h}$ D) $a = \frac{2Ab - h}{h}$

Answer: C

460) $d = rt$ for t

A) $t = dr$ B) $t = \frac{r}{d}$ C) $t = d - r$ D) $t = \frac{d}{r}$

Answer: D

461) $P = 2L + 2W$ for W

A) $W = P - 2L$ B) $W = \frac{P - L}{2}$ C) $W = P - L$ D) $W = \frac{P - 2L}{2}$

Answer: D

462) $A = P(1 + nr)$ for n

A) $n = \frac{Pr}{A - P}$ B) $n = \frac{A}{r}$ C) $n = \frac{P - A}{Pr}$ D) $n = \frac{A - P}{Pr}$

Answer: D

463) $I = Prt$ for P

A) $P = \frac{r - I}{1 + t}$ B) $P = \frac{I}{rt}$ C) $P = r - It$ D) $P = \frac{r - 1}{It}$

Answer: B

464) $\frac{1}{a} + \frac{1}{b} = \frac{1}{c}$ for c

A) $c = a + b$ B) $c = \frac{a + b}{ab}$ C) $c = ab(a + b)$ D) $c = \frac{ab}{a + b}$

Answer: D

465) $P = \frac{A}{1 + rt}$ for r

A) $r = \frac{P - 1}{At}$ B) $r = P - At$ C) $r = \frac{A - P}{Pt}$ D) $r = \frac{P - A}{1 + t}$

Answer: C

466) $A = \frac{1}{2}h(B + b)$ for B

A) $B = \frac{2A - bh}{h}$ B) $B = 2A - bh$ C) $B = \frac{2A + bh}{h}$ D) $B = \frac{A - bh}{h}$

Answer: A

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: A

468) $I = \frac{nE}{nr + R}$ for n

A) $n = \frac{-R}{Ir - E}$ B) $n = \frac{IR}{E - Ir}$ C) $n = \frac{IR}{Ir + E}$ D) $n = IR(Ir - E)$

Answer: B

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}

Answer: A

470) $|x - 9| = 5$

A) {4, 14} B) {–14} C) ∅ D) {–4, 14}

Answer: A

471) $|x - 2| = 9$

A) {–7, 11} B) {11} C) {–11, 7} D) ∅

Answer: A

472) $|7x + 3| = 6$

A) $\{1, -3\}$ B) $\left\{\frac{3}{7}, -\frac{9}{7}\right\}$ C) $\left\{-\frac{3}{7}, \frac{9}{7}\right\}$ D) ∅

Answer: B

473) $3|x - 3| = 18$

A) {9, –3} B) ∅ C) {3} D) {3, –9}

Answer: A

474) $|x + 2| + 6 = 11$

A) {3} B) {–3, 7} C) {–7, 3} D) ∅

Answer: C

475) $|5x + 9| + 7 = 15$

A) ∅ B) $\left\{\frac{1}{5}, \frac{17}{5}\right\}$ C) $\left\{-\frac{17}{5}, -\frac{1}{5}\right\}$ D) $\left\{-\frac{17}{9}, -\frac{1}{9}\right\}$

Answer: C

476) $|4x - 7| - 5 = -10$

A) $\left\{3, -\frac{1}{2}\right\}$ B) $\left\{\frac{1}{2}, -3\right\}$ C) ∅ D) $\left\{\frac{1}{2}\right\}$

Answer: C

477) $\left|3 - \frac{1}{5}x\right| = 5$

A) {– 40, – 10} B) {– 2, 8} C) {–8, – 2} D) {40, – 10}

Answer: D

478) $\left|2 - \frac{4}{5}x\right| - 5 = 9$

A) {– 15, 20} B) $\left\{-\frac{48}{5}\right\}$ C) {– 15} D) {15, – 20}

Answer: A

Solve the equation by factoring.

479) $x^2 = x + 42$

A) {6, 7} B) {1, 42} C) {–6, 7} D) {–6, –7}

Answer: C

480) $x^2 + 10x - 24 = 0$

A) {–12, 2} B) {–12, 1} C) {12, 2} D) {12, –2}

Answer: A

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) $\left\{\frac{5}{2}, \frac{3}{4}\right\}$ D) $\left\{-\frac{5}{8}, -\frac{1}{5}\right\}$

Answer: B

482) $9x^2 - 71x = 8$

A) $\{-9, 8\}$ B) $\left\{\frac{1}{71}, -\frac{1}{9}\right\}$ C) $\left\{-\frac{1}{9}, 8\right\}$ D) $\left\{-\frac{1}{9}, 9\right\}$

Answer: C

483) $7x^2 - 3x = 0$

A) $\left\{0, \frac{3}{7}\right\}$ B) $\left\{\frac{3}{7}, -\frac{3}{7}\right\}$ C) $\left\{-\frac{3}{7}, 0\right\}$ D) $\{0\}$

Answer: A

484) $3x(x - 3) = 7x^2 - 10x$

A) $\{0\}$ B) $\{0, 4\}$ C) $\left\{-\frac{1}{4}, 0\right\}$ D) $\left\{0, \frac{1}{4}\right\}$

Answer: D

485) $7 - 7x = (4x + 9)(x - 1)$

A) $\{-4, 1\}$ B) $\{-1, 4\}$ C) $\left\{1, -\frac{9}{4}\right\}$ D) $\{1\}$

Answer: A

486) $-6x - 2 = (3x + 1)^2$

A) $\varnothing$ B) $\left\{\frac{1}{3}, 1\right\}$ C) $\left\{-1, -\frac{1}{3}\right\}$ D) $\left\{-\frac{1}{3}\right\}$

Answer: C

Solve the quadratic equation by the square root property.

487) $2x^2 = 32$

A) $\{-4, 4\}$ B) $\{-2, 2\}$ C) $\{-4\sqrt{2}, 4\sqrt{2}\}$ D) $\{0\}$

Answer: A

488) $4x^2 = 28$

A) $\{14\}$ B) $\{8\}$ C) $\{-\sqrt{7}, \sqrt{7}\}$ D) $\{-7, 7\}$

Answer: C

489) $2x^2 + 4 = 342$

A) $\{-14, 14\}$ B) $\{171\}$ C) $\{-13, 13\}$ D) $\{13\}$

Answer: C

490) $(x - 6)^2 = 25$

A) $\{31\}$ B) $\{1, 11\}$ C) $\{-11, 1\}$ D) $\{-5, 5\}$

Answer: B

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) {–4, 1} B) {0, 1} C) {1, 4} D) {–14, 14}

Answer: A

493) $3(x - 8)^2 = 15$

A) {–13, –3} B) {3, 13} C) $\{8 - \sqrt{5}, 8 + \sqrt{5}\}$ D) $\{-8 - \sqrt{5}, -8 + \sqrt{5}\}$

Answer: C

494) $(2x + 3)^2 = 7$

A) $\left\{\frac{\sqrt{7} - 3}{2}, \frac{\sqrt{7} + 3}{2}\right\}$ B) $\left\{\frac{-3 - \sqrt{7}}{2}, \frac{-3 + \sqrt{7}}{2}\right\}$

C) $\{-5, 2\}$ D) $\left\{\frac{3 - \sqrt{7}}{2}, \frac{3 + \sqrt{7}}{2}\right\}$

Answer: B

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) $\{-2\sqrt{11}, 2\sqrt{11}\}$

Answer: B

Solve the quadratic equation by completing the square.

496) $x^2 - 8x - 33 = 0$

A) $\{-\sqrt{33}, \sqrt{33}\}$ B) {–3, –30} C) {–11, 3} D) {–3, 11}

Answer: D

497) $x^2 + 14x = -38$

A) $\{7 - \sqrt{38}, 7 + \sqrt{38}\}$ B) $\{-7 - \sqrt{11}, -7 + \sqrt{11}\}$

C) $\{-14 + \sqrt{38}\}$ D) $\{7 + \sqrt{11}\}$

Answer: B

498) $x^2 + 14x + 30 = 0$

A) $\{-14 + \sqrt{30}\}$ B) $\{7 + \sqrt{19}\}$

C) $\{7 - \sqrt{30}, 7 + \sqrt{30}\}$ D) $\{-7 - \sqrt{19}, -7 + \sqrt{19}\}$

Answer: D

499) $x^2 + 8x - 3 = 0$

A) $\{-4 - 1\sqrt{19}, -4 + 1\sqrt{19}\}$ B) $\{-1 - \sqrt{19}, -1 + \sqrt{19}\}$

C) $\{-4 - \sqrt{19}, -4 + \sqrt{19}\}$ D) $\{4 + \sqrt{19}\}$

Answer: C

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) $\{8 + 2\sqrt{11}, 8 - 2\sqrt{11}\}$
C) $\{-8 + 2\sqrt{5}, -8 - 2\sqrt{5}\}$
D) $\{-16 + 2\sqrt{11}\}$

Answer: C

502) $x^2 + 4x = 16$

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

Answer: A

503) $x^2 + 3x - 9 = 0$

A) $\{-3 - 3\sqrt{5}, -3 + 3\sqrt{5}\}$
B) $\left\{\frac{-3 - 3\sqrt{5}}{2}\right\}$
C) $\left\{\frac{3 + 3\sqrt{5}}{2}\right\}$
D) $\left\{\frac{-3 - 3\sqrt{5}}{2}, \frac{-3 + 3\sqrt{5}}{2}\right\}$

Answer: D

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) $\left\{\frac{1 - \sqrt{22}}{7}, \frac{1 + \sqrt{22}}{7}\right\}$

Answer: D

Solve the quadratic equation using the quadratic formula.

505) $x^2 + 2x - 63 = 0$

A) $\{9, 7\}$
B) $\{-9, 1\}$
C) $\{-7, 9\}$
D) $\{-9, 7\}$

Answer: D

506) $x^2 + 10x + 14 = 0$

A) $\{5 - \sqrt{14}, 5 + \sqrt{14}\}$
B) $\{5 + \sqrt{11}\}$
C) $\{-5 - \sqrt{11}, -5 + \sqrt{11}\}$
D) $\{-10 + \sqrt{14}\}$

Answer: C

507) $x^2 + 4x = 3$

A) $\{-2 - \sqrt{7}, -2 + \sqrt{7}\}$
B) $\{2 + \sqrt{7}\}$
C) $\{-2 - 2\sqrt{7}, -2 + 2\sqrt{7}\}$
D) $\{-1 - \sqrt{7}, -1 + \sqrt{7}\}$

Answer: A

508) $x^2 + 5x + 1 = 0$

A) $\left\{\frac{-5-\sqrt{21}}{10}, \frac{-5+\sqrt{21}}{10}\right\}$

B) $\left\{\frac{-5-\sqrt{21}}{2}, \frac{-5+\sqrt{21}}{2}\right\}$

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: B

509) $2x^2 + 10x + 7 = 0$

A) $\left\{\frac{-5-\sqrt{11}}{4}, \frac{-5+\sqrt{11}}{4}\right\}$

B) $\left\{\frac{-5-\sqrt{39}}{2}, \frac{-5+\sqrt{39}}{2}\right\}$

C) $\left\{\frac{-10-\sqrt{11}}{2}, \frac{-10+\sqrt{11}}{2}\right\}$

D) $\left\{\frac{-5-\sqrt{11}}{2}, \frac{-5+\sqrt{11}}{2}\right\}$

Answer: D

510) $2x^2 + x - 5 = 0$

A) $\left\{\frac{-1-\sqrt{41}}{4}, \frac{-1+\sqrt{41}}{4}\right\}$

B) $\left\{\frac{1-\sqrt{41}}{4}, \frac{1+\sqrt{41}}{4}\right\}$

C) $\varnothing$

D) $\left\{\frac{-1-\sqrt{41}}{2}, \frac{-1+\sqrt{41}}{2}\right\}$

Answer: A

511) $7x^2 = -10x - 2$

A) $\left\{\frac{-5-\sqrt{11}}{14}, \frac{-5+\sqrt{11}}{14}\right\}$

B) $\left\{\frac{-5-\sqrt{11}}{7}, \frac{-5+\sqrt{11}}{7}\right\}$

C) $\left\{\frac{-10-\sqrt{11}}{7}, \frac{-10+\sqrt{11}}{7}\right\}$

D) $\left\{\frac{-5-\sqrt{39}}{7}, \frac{-5+\sqrt{39}}{7}\right\}$

Answer: B

Compute the discriminant. Then determine the number and type of solutions for the given equation.

512) $x^2 + 3x + 2 = 0$

A) 0; one real solution

B) 1; two unequal real solutions

C) −17; no real solution

D) 1; one real solution

Answer: B

513) $x^2 - 10x + 25 = 0$

A) −100; two unequal real solutions

B) 100; two unequal real solutions

C) −100; no real solution

D) 0; one real solution

Answer: D

514) $7x^2 = -2x - 1$

A) 32; two unequal real solutions

B) 0; one real solution

C) −32; no real solution

D) −24; no real solution

Answer: D

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) $\left\{-\frac{1}{9}, 9\right\}$ B) $\{-9, 4\}$ C) $\left\{-\frac{1}{9}, \frac{1}{35}\right\}$ D) $\left\{-\frac{1}{9}, 4\right\}$

Answer: D

517) $2x^2 = 7x + 9$

A) $\left\{\frac{2}{9}, 1\right\}$ B) $\left\{\frac{2}{9}, -1\right\}$ C) $\left\{\frac{9}{2}, -1\right\}$ D) $\left\{\frac{2}{9}, 0\right\}$

Answer: C

518) $3x^2 - 9 = 26x$

A) $\left\{-\frac{1}{3}, 3\right\}$ B) $\{-3, 9\}$ C) $\left\{\frac{1}{26}, -\frac{1}{3}\right\}$ D) $\left\{-\frac{1}{3}, 9\right\}$

Answer: D

519) $3x^2 - 108 = 0$

A) $\{-6, 6\}$ B) $\{-6\sqrt{3}, 6\sqrt{3}\}$ C) $\{0\}$ D) $\{-3, 3\}$

Answer: A

520) $x^2 + 6x = -9$

A) $\{-3\}$ B) $\{-3, 3]$ C) $\{3\}$ D) $\{-\sqrt{3}\}$

Answer: A

521) $x^2 + 4x = 3$

A) $\{-2 - 2\sqrt{7}, -2 + 2\sqrt{7}\}$ B) $\{-2 - \sqrt{7}, -2 + \sqrt{7}\}$

C) $\{2 + \sqrt{7}\}$ D) $\{-1 - \sqrt{7}, -1 + \sqrt{7}\}$

Answer: B

522) $3x^2 + 8x = -2$

A) $\left\{\frac{-8 - \sqrt{10}}{3}, \frac{-8 + \sqrt{10}}{3}\right\}$ 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) $\left\{\frac{-4 - \sqrt{22}}{3}, \frac{-4 + \sqrt{22}}{3}\right\}$

Answer: C

523) $2x^2 = -10x - 5$

A) $\left\{\frac{-5-\sqrt{35}}{2}, \frac{-5+\sqrt{35}}{2}\right\}$

B) $\left\{\frac{-10-\sqrt{15}}{2}, \frac{-10+\sqrt{15}}{2}\right\}$

C) $\left\{\frac{-5-\sqrt{15}}{2}, \frac{-5+\sqrt{15}}{2}\right\}$

D) $\left\{\frac{-5-\sqrt{15}}{4}, \frac{-5+\sqrt{15}}{4}\right\}$

Answer: C

524) $4x^2 + 12x + 6 = 0$

A) $\left\{\frac{-12-\sqrt{3}}{2}, \frac{-12+\sqrt{3}}{2}\right\}$

B) $\left\{\frac{-3-\sqrt{3}}{8}, \frac{-3+\sqrt{3}}{8}\right\}$

C) $\left\{\frac{-3-\sqrt{3}}{2}, \frac{-3+\sqrt{3}}{2}\right\}$

D) $\left\{\frac{-3-\sqrt{15}}{2}, \frac{-3+\sqrt{15}}{2}\right\}$

Answer: C

525) $5x^2 = 65$

A) {32.5}

B) {14}

C) {–13, 13}

D) $\{-\sqrt{13}, \sqrt{13}\}$

Answer: D

526) $11x^2 - 55 = 0$

A) $\{-\sqrt{55}, \sqrt{55}\}$

B) $\{\sqrt{5}\}$

C) $\{-\sqrt{5}, \sqrt{5}\}$

D) $\left\{-\frac{\sqrt{55}}{11}, \frac{\sqrt{55}}{11}\right\}$

Answer: C

527) $x^2 + 10x + 15 = 0$

A) $\{-5-\sqrt{10}, -5+\sqrt{10}\}$

B) $\{-10+\sqrt{15}\}$

C) $\{5-\sqrt{15}, 5+\sqrt{15}\}$

D) $\{5+\sqrt{10}\}$

Answer: A

528) $(5x + 3)^2 = 5$

A) $\left\{\frac{\sqrt{5}-3}{5}, \frac{\sqrt{5}+3}{5}\right\}$

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) $\left\{-\frac{8}{5}, \frac{2}{5}\right\}$

Answer: C

529) $(x + 4)(x - 9) = 7$

A) $\left\{\frac{-5-i\sqrt{197}}{2}, \frac{-5+i\sqrt{197}}{2}\right\}$

B) $\left\{\frac{5-\sqrt{197}}{2}, \frac{5+\sqrt{197}}{2}\right\}$

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: B

530) $\frac{x^2}{18} + x + \frac{59}{18} = 0$

A) $\{9 - \sqrt{59}, 9 + \sqrt{59}\}$
B) $\{-18 + \sqrt{59}\}$
C) $\{-9 - \sqrt{22}, -9 + \sqrt{22}\}$
D) $\{9 + \sqrt{22}\}$

Answer: C

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) $\left\{\frac{-3 - \sqrt{149}}{2}, \frac{-3 + \sqrt{149}}{2}\right\}$

Answer: C

532) $\frac{9}{x-7} + \frac{x}{x+7} = \frac{67}{x^2 - 49}$

A) $\{-1 - \sqrt{5}, -1 + \sqrt{5}\}$
B) $\{1 - \sqrt{5}, 1 + \sqrt{5}\}$
C) $\{1 - \sqrt{23}, 1 + \sqrt{23}\}$
D) $\{-1 - \sqrt{23}, -1 + \sqrt{23}\}$

Answer: A

533) $\frac{y}{y+4} + \frac{8y+28}{y^2+7y+12} = \frac{4}{y+3}$

A) $\{-3, -4\}$
B) $\{4, 3\}$
C) $\{-6, 5\}$
D) $\varnothing$

Answer: D

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) $\left\{\frac{\sqrt{3} - \sqrt{23}}{10}, \frac{\sqrt{3} + \sqrt{23}}{10}\right\}$

Answer: D

Solve the radical equation, and check all proposed solutions.

535) $\sqrt{x+2} = 2$

A) $\{2\}$
B) $\{16\}$
C) $\{4\}$
D) $\{6\}$

Answer: A

536) $\sqrt{3x-2} = 2$

A) $\left\{\frac{2}{3}\right\}$
B) $\{4\}$
C) $\{2\}$
D) $\varnothing$

Answer: C

537) $\sqrt{x-3} = x - 5$

A) $\{7\}$
B) $\{-7\}$
C) $\{4\}$
D) $\{4, 7\}$

Answer: A

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) {6} B) {–3} C) {4} D) {–4}

Answer: C

540) $x - 7 = \sqrt{3x + 7}$

A) {7} B) {14} C) ∅ D) {3, 14}

Answer: B

541) $\sqrt{14x - 7} - 3 = x$

A) {–3} B) {4} C) {–4} D) {3}

Answer: B

542) $x - \sqrt{3x - 2} = 4$

A) {9} B) {1, 2} C) {–1} D) {2, 9}

Answer: A

543) $\sqrt{2x} + 11 = x + 7$

A) {8} B) {2, 8} C) $\left\{-4, \frac{4}{3}\right\}$ D) {–4}

Answer: A

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) 58 hr C) 49 hr D) 93 hr

Answer: A

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) 2,002 B) 2,007 C) 2,005 D) 2,006

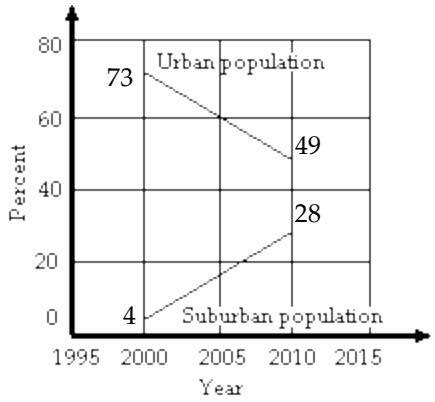
Answer: A

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) 2,007 B) 2,005 C) 2,004 D) 2,006

Answer: B

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) 2,015 C) 2,016 D) 2,020

Answer: B

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) 75 mi B) 225 mi C) 800 mi D) 100 mi

Answer: D

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) 26 times C) 27 times D) 25 times

Answer: D

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) $5,000 invested at 6%; $5,000 invested at 11%
B) $4,000 invested at 6%; $6,000 invested at 11%
C) $6,000 invested at 6%; $4,000 invested at 11%
D) $7,000 invested at 6%; $3,000 invested at 11%

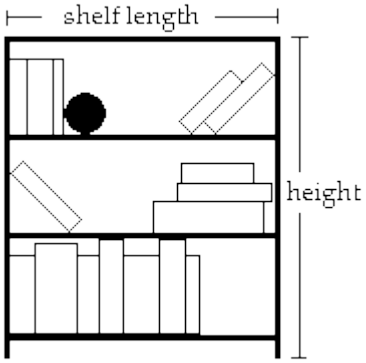
Answer: C

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) $40,000 invested at 4%; $16,000 invested at 10%
B) $30,000 invested at 4%; $26,000 invested at 10%
C) $16,000 invested at 4%; $40,000 invested at 10%
D) $26,000 invested at 4%; $30,000 invested at 10%

Answer: A

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: 4.5 ft; height: 7.5 ft
B) length: 3 ft; height: 9 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) 6 hr
B) 6.5 hr
C) 5 hr
D) 7 hr

Answer: A

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) $170,882.35
B) $33,988.50
C) $4,938.50
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) $162.09
B) $2,100
C) $2,413.29
D) $2,089.11

Answer: B

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) $66.00
B) $2,134.00
C) $169.23
D) $6.60

Answer: C

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: 6 cm
C) Width: 2 cm; length: 4 cm
D) Width: 3 cm; length: 7 cm

Answer: B

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: 45 ft; length: 47 ft
D) Width: 60 ft; length: 124 ft

Answer: B

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) 46.6 ft B) 16 ft C) 6.6 ft D) 17.4 ft

Answer: D

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) 16 sophomores; 30 juniors
B) 30 sophomores; 16 juniors
C) 46 sophomores; 32 juniors
D) 60 sophomores; 32 juniors

Answer: B

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: $13,500; department head's salary: $4,500
C) president's salary: $90,000; department head's salary: $45,000
D) president's salary: $45,000; department head's salary: $135,000

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: 216 mi, Lana: 648 mi, Mark: 663 mi
C) Tony: 72 mi, Lana: 216 mi, Mark: 231 mi
D) Tony: 67 mi, Lana: 201 mi, Mark: 216 mi

Answer: C

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) 16°, 41°, 123° C) 16°, 48°, 116° 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.: 30 medals; China: 29 medals; Romania: 28 medals
B) U.S.: 29 medals; China: 28 medals; Romania: 27 medals
C) U.S.: 27 medals; China: 26 medals; Romania: 25 medals
D) U.S.: 86 medals; China: 85 medals; Romania: 84 medals

Answer: B

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) 6 hr B) 9 hr C) 5 hr D) 10 hr

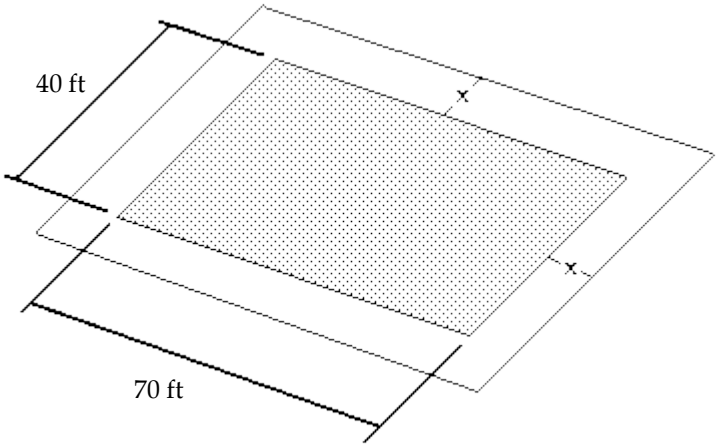
Answer: A

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) 83 min C) 2,083 min D) 830 min

Answer: D

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) 3 ft C) 6 ft D) 9 ft

Answer: B

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: 11 yd; length: 16 yd
B) Width: 21 yd; length: 26 yd
C) Width: 6 yd; length: 11 yd
D) Width: 16 yd; length: 21 yd

Answer: A

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) 9 in. D) 7 in.

Answer: D

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: 30 mph
freight train: 15 mph
B) passenger train: 60 mph
freight train: 45 mph
C) passenger train: 75 mph
freight train: 60 mph
D) passenger train: 45 mph
freight train: 30 mph

Answer: D

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) 49 mph B) 7 mph C) 21 mph D) 28 mph

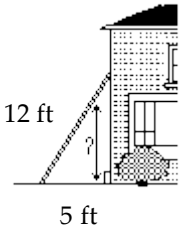
Answer: B

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) 7 ft B) 5 ft C) 2.5 ft D) 10 ft

Answer: B

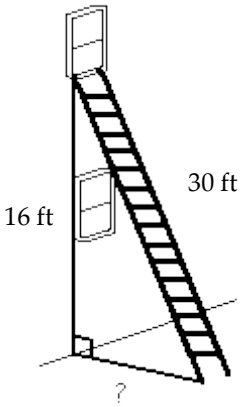
573) A 12–foot ladder is leaning against a house with the base of the ladder 5 feet from the house. How high up the house does the ladder reach? If necessary, round to the nearest tenth foot.



A) 13 ft B) 7 ft C) 11 ft D) 10.9 ft

Answer: D

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) 1,156 ft C) 644 ft D) 34 ft

Answer: A

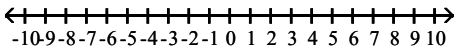
575) Two cars leave an intersection. One car travels north; the other east. When the car traveling north had gone 6 miles, the distance between the cars was 2 miles more than the distance traveled by the car heading east. How far had the east bound car traveled?

A) 10 mi B) 12 mi C) 8 mi D) 6 mi

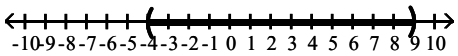
Answer: C

Express the interval in set–builder notation and graph the interval on a number line.

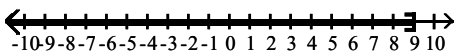
576) $(-4, 9]$



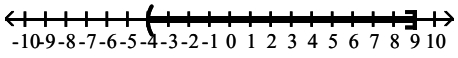
A) $\{x \mid -4 < x < 9\}$



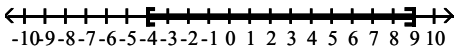
B) $\{x \mid x \le 9\}$



C) $\{x \mid -4 < x \le 9\}$

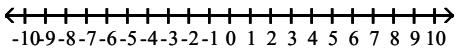


D) $\{x \mid -4 \le x \le 9\}$

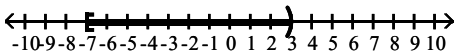


Answer: C

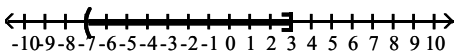
577) $[-7, 3)$



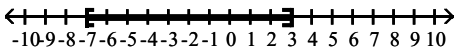
A) $\{x \mid -7 \le x < 3\}$



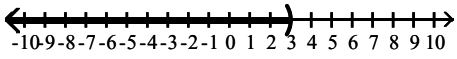
B) $\{x \mid -7 < x \le 3\}$



C) $\{x \mid -7 \le x \le 3\}$

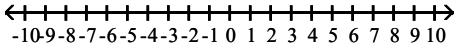


D) $\{x \mid x < 3\}$

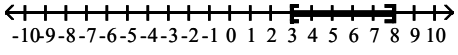


Answer: A

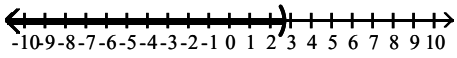
578) $\left(-\infty, \frac{8}{3}\right)$



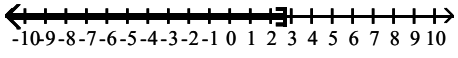
A) $\{x \mid 3 \le x \le 8\}$



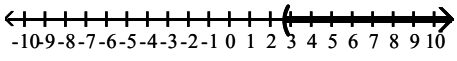
B) $\left\{x \mid x < \frac{8}{3}\right\}$



C) $\left\{x \mid x \le \frac{8}{3}\right\}$

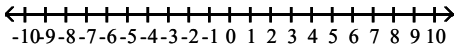


D) $\left\{x \mid x > \frac{8}{3}\right\}$

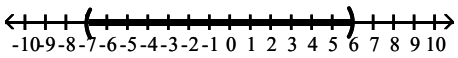


Answer: B

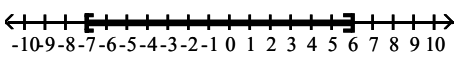
579) $[-7, 6]$



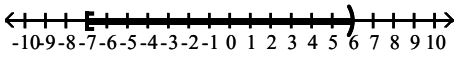
A) $\{x \mid -7 < x < 6\}$



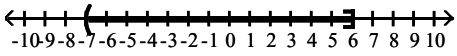
B) $\{x \mid -7 \le x \le 6\}$



C) $\{x \mid -7 \le x < 6\}$

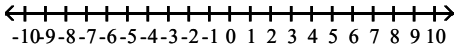


D) $\{x \mid -7 < x \le 6\}$

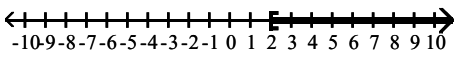


Answer: B

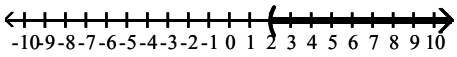
580) $(2, \infty)$



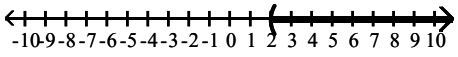
A) $\{x \mid x > 2\}$



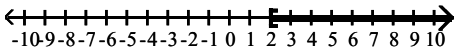
B) $\{x \mid x \ge 2\}$



C) $\{x \mid x > 2\}$

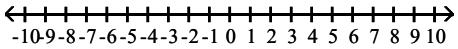


D) $\{x \mid x \ge 2\}$

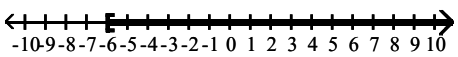


Answer: C

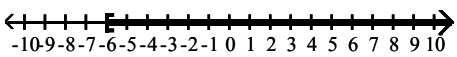
581) $[-6, \infty)$



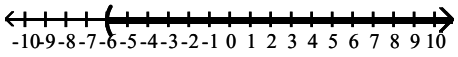
A) $\{x \mid x > -6\}$



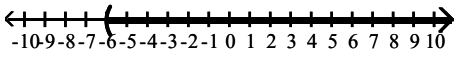
B) $\{x \mid x \ge -6\}$



C) $\{x \mid x \ge -6\}$

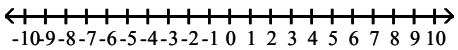


D) $\{x \mid x > -6\}$

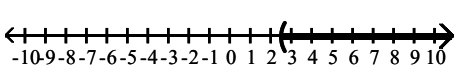


Answer: B

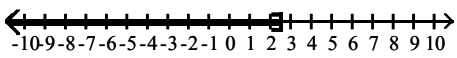
582) $(-\infty, 2.5]$



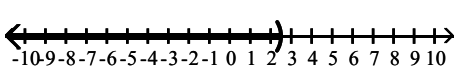
A) $\{x \mid x > 2.5\}$



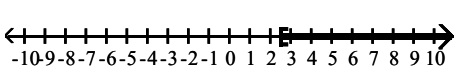
B) $\{x \mid x \le 2.5\}$



C) $\{x \mid x < 2.5\}$



D) $\{x \mid x \ge 2.5\}$



Answer: B

Use graphs to find the set.

583) $(-10, 0) \cap [-3, 2]$

A) $(0, 2]$ B) $(-10, 2]$ C) $(-10, -3]$ D) $[-3, 0)$

Answer: D

584) $(-9, 0) \cup [-2, 3]$

A) $(0, 3]$ B) $(-9, 3]$ C) $(-9, -2]$ D) $[-2, 0)$

Answer: B

585) $(-\infty, 7) \cap [-7, 19)$

A) $(-\infty, 19)$ B) $(-\infty, -7]$ C) $(7, 19)$ D) $[-7, 7)$

Answer: D

586) $(-\infty, 9) \cup [-3, 11)$

A) $[-3, 9)$ B) $(-\infty, 11)$ C) $(-\infty, -3]$ D) $(9, 11)$

Answer: B

587) $(9, \infty) \cap [18, \infty)$

A) $(9, 18]$ B) $(-\infty, \infty)$ C) $[18, \infty)$ D) $(9, \infty)$

Answer: C

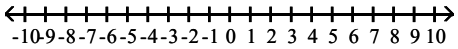
588) $(8, \infty) \cup [11, \infty)$

A) $[11, \infty)$ B) $(-\infty, \infty)$ C) $(8, \infty)$ D) $(8, 11]$

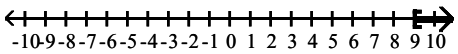
Answer: C

Solve the linear inequality. Other than ∅, use interval notation to express the solution set and graph the solution set on a number line.

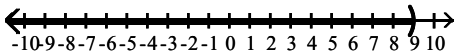
589) $4x + 1 < 37$



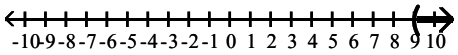
A) $[9, \infty)$



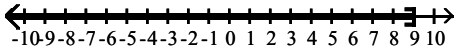
B) $(-\infty, 9)$



C) $(9, \infty)$

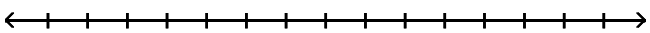


D) $(-\infty, 9]$

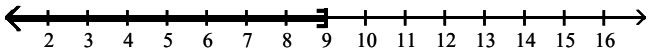


Answer: B

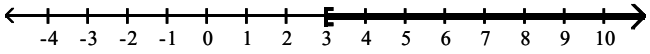
590) $4x - 12 \geq 24$



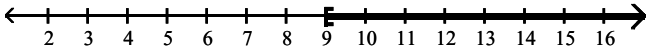
A) $(-\infty, 9]$



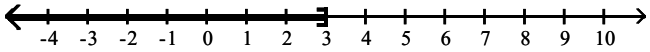
B) $[3, \infty)$



C) $[9, \infty)$

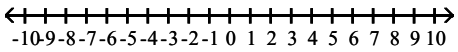


D) $(-\infty, 3]$

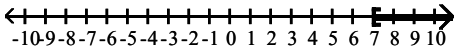


Answer: C

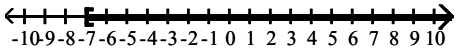
591) $-9x \geq 63$



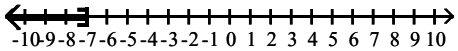
A) $[7, \infty)$



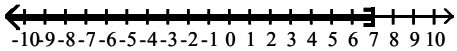
B) $[-7, \infty)$



C) $(-\infty, -7]$

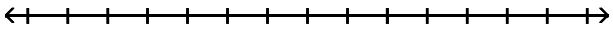


D) $(-\infty, 7]$

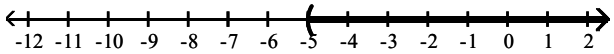


Answer: C

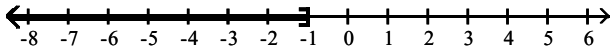
592) $4x - 2 > 3x - 3$



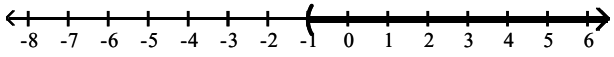
A) $(-5, \infty)$



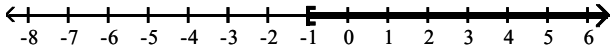
B) $(-\infty, -1]$



C) $(-1, \infty)$

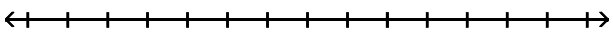


D) $[-1, \infty)$

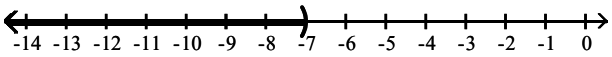


Answer: C

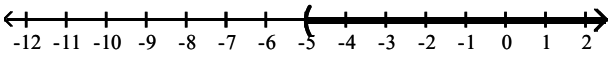
593) $3x + 1 \geq 2x - 6$



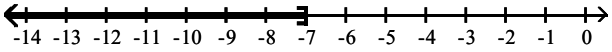
A) $(-\infty, -7)$



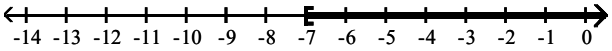
B) $(-5, \infty)$



C) $(-\infty, -7]$

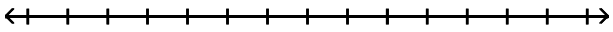


D) $[-7, \infty)$

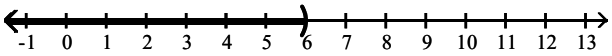


Answer: D

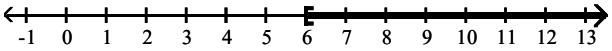
594) $10x + 2 > 2(4x + 7)$



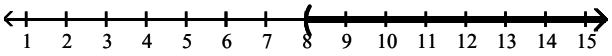
A) $(-\infty, 6)$



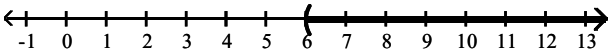
B) $[6, \infty)$



C) $(8, \infty)$

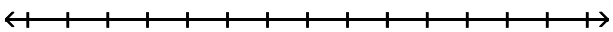


D) $(6, \infty)$

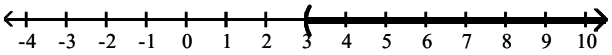


Answer: D

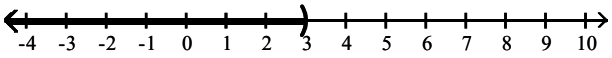
595) $-2(6x + 8) < -14x - 10$



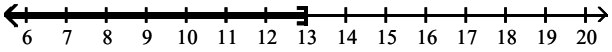
A) $(3, \infty)$



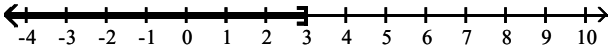
B) $(-\infty, 3)$



C) $(-\infty, 13]$

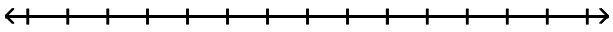


D) $(-\infty, 3]$

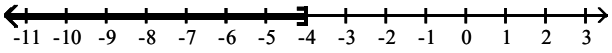


Answer: B

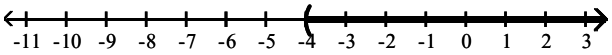
596) $-15x + 5 \leq -5(2x - 5)$



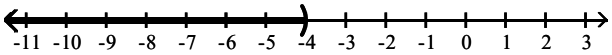
A) $(-\infty, -4]$



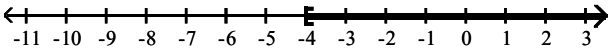
B) $(-4, \infty)$



C) $(-\infty, -4)$

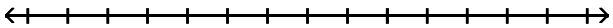


D) $[-4, \infty)$

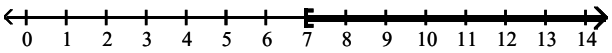


Answer: D

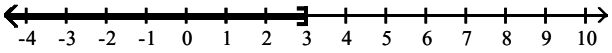
597) $8x + 4 \le 2(3x + 5)$



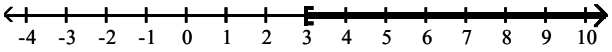
A) $[-\infty, 7)$



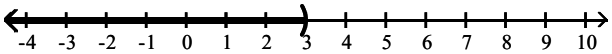
B) $(-\infty, 3]$



C) $[3, \infty)$

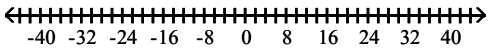


D) $(-\infty, 3)$

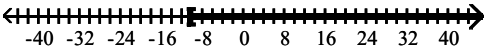


Answer: B

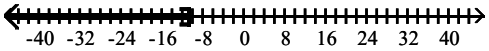
598) $\frac{x}{5} - \frac{1}{5} \le \frac{x}{2} + 3$



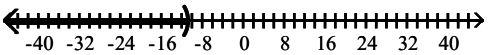
A) $\left[-\frac{32}{3}, \infty\right)$



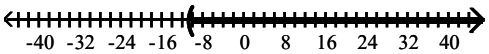
B) $\left(-\infty, -\frac{32}{3}\right]$



C) $\left(-\infty, -\frac{32}{3}\right)$

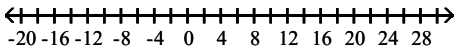


D) $\left(-\frac{32}{3}, \infty\right)$

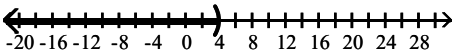


Answer: A

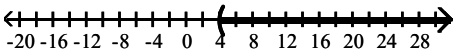
599) $\frac{x-3}{16} \ge \frac{x-3}{20} + \frac{1}{80}$



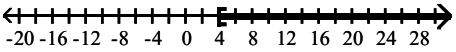
A) $(-\infty, 4)$



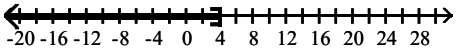
B) $(4, \infty)$



C) $[4, \infty)$

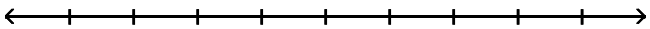


D) $(-\infty, 4]$

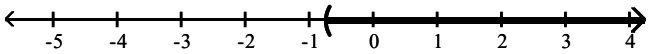


Answer: C

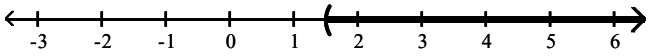
600) $\frac{2}{3} - \frac{8}{9}x < 2$



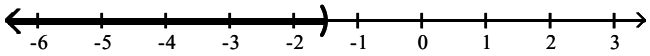
A) $\left(-\frac{3}{4}, \infty\right)$



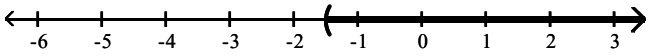
B) $\left(\frac{3}{2}, \infty\right)$



C) $\left(-\infty, -\frac{3}{2}\right)$

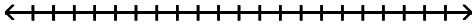


D) $\left(-\frac{3}{2}, \infty\right)$

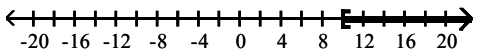


Answer: D

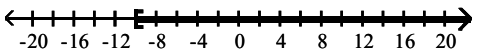
601) $\frac{x}{2} \geq \frac{x}{10} + 4$



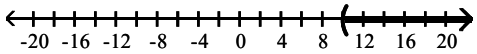
A) [10, ∞)



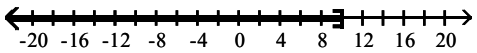
B) [–10, ∞)



C) (10, ∞)

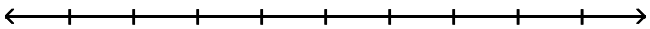


D) (–∞, 10]

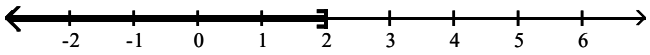


Answer: A

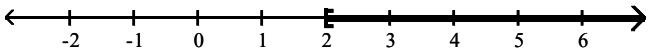
602) $\frac{x}{18} \leq \frac{x}{3} - \frac{3x+1}{9}$



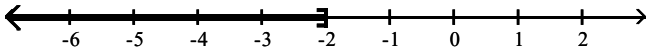
A) $(-\infty, 2]$



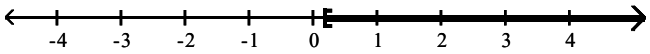
B) $[2, \infty)$



C) $(-\infty, -2]$

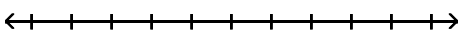


D) $\left[\frac{2}{11}, \infty\right)$

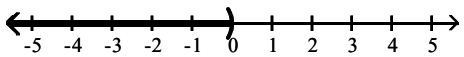


Answer: C

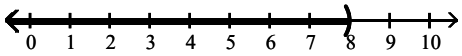
603) $-4(-2 - x) < 6x + 19 - 11 - 2x$



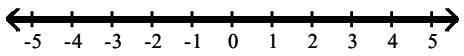
A) $(-\infty, 0)$



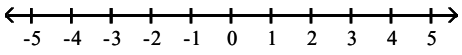
B) $(-\infty, 8)$



C) $(-\infty, \infty)$

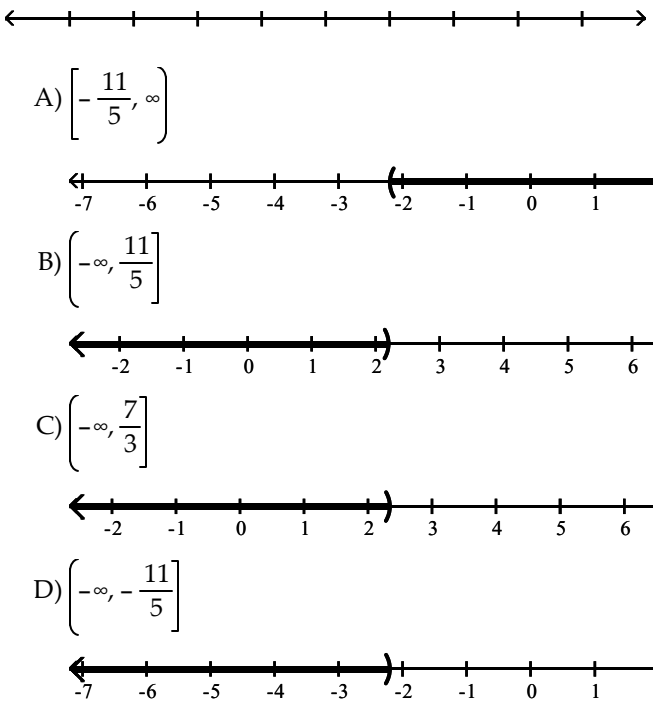


D) $\varnothing$



Answer: D

604) $-4(2x + 1) \geq 2[4x - 3(x - 3)]$



Answer: D

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) 2 minutes or fewer
B) 20 minutes or fewer
C) 14 minutes or fewer
D) 11 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) 84 candies or fewer
B) 1,596 candies or fewer
C) 7,752 candies or fewer
D) 4,812 candies or fewer

Answer: D

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) 5 pages or fewer
B) 7 pages or fewer
C) 44 pages or fewer
D) 2 pages or fewer

Answer: A

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) 79 or greater
C) 81 or greater
D) 80 or greater

Answer: D

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 2,003 B) Years after 2,001 C) Years after 2,007 D) Years after 2,005

Answer: A

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 600 minutes B) More than 60 minutes
C) More than 600 minutes D) Less than 60 minutes

Answer: A

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 405 cars C) At least 3,047 cars D) At least 4,047 cars

Answer: D

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) 23 or more rides B) 22 or more rides C) 20 or more rides D) 21 or more rides

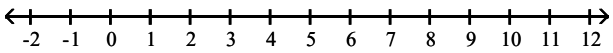
Answer: B

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

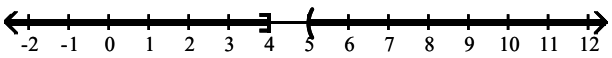
Answer: A

Solve the compound inequality. Other than ∅, use interval notation to express the solution set and graph the solution set on a number line.

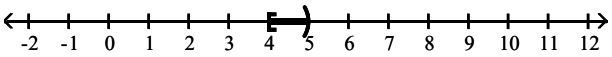
614) $8 < 2x \leq 10$



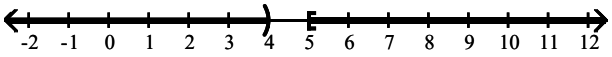
A) $(-\infty, 4] \cup (5, \infty)$



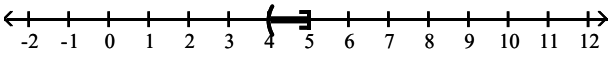
B) $[4, 5)$



C) $(-\infty, 4) \cup [5, \infty)$

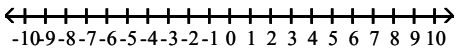


D) $(4, 5]$

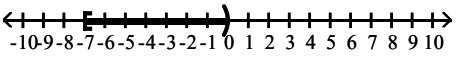


Answer: D

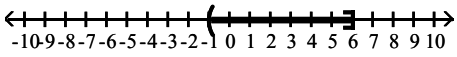
615) $-4 < x + 3 \leq 3$



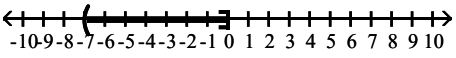
A) $[-7, 0)$



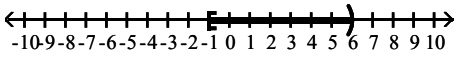
B) $(-1, 6]$



C) $(-7, 0]$

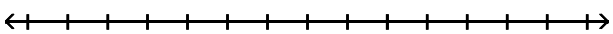


D) $[-1, 6)$

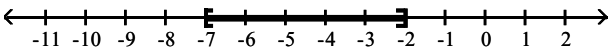


Answer: C

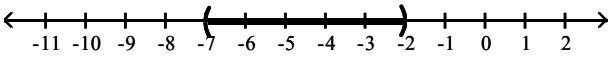
616) $2 \le 3x - 4 \le 17$



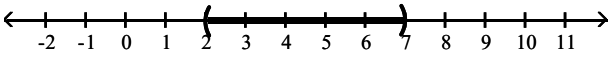
A) [–7, –2]



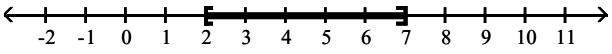
B) (–7, –2)



C) (2, 7)

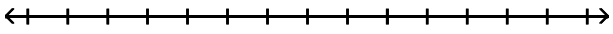


D) [2, 7]

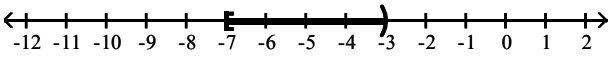


Answer: D

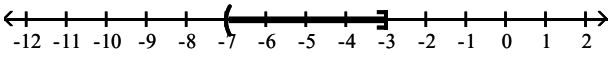
617) $-31 \le -5x + 4 < -11$



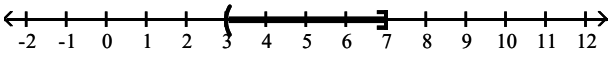
A) [–7, –3)



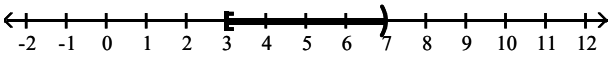
B) (–7, –3]



C) (3, 7]

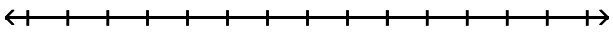


D) [3, 7)

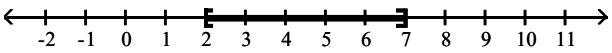


Answer: C

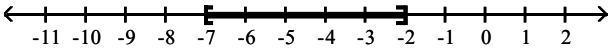
618) $-23 \le -3x - 2 \le -8$



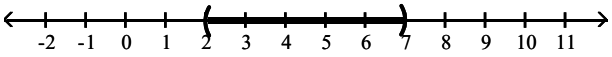
A) [2, 7]



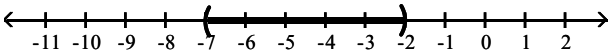
B) [–7, –2]



C) (2, 7)

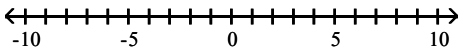


D) (–7, –2)

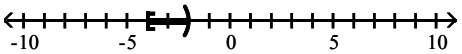


Answer: A

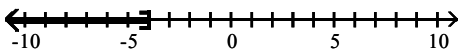
619) $-4 \le -4x - 12 < 4$



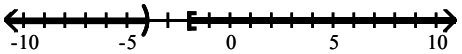
A) [–4, –2)



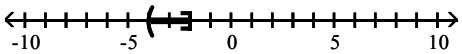
B) (–∞, –4]



C) (–∞, –4) or [–2, ∞)

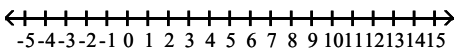


D) (–4, –2]

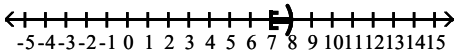


Answer: D

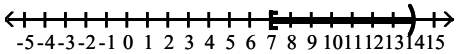
620) $11 \le \frac{6}{7}x + 5 < 17$



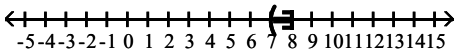
A) [7, 8)



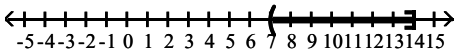
B) [7, 14)



C) (7, 8]



D) (7, 14]



Answer: B

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) (–12°F, –7°F) C) [122°F, 212°F] D) (122°F, 212°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) (122°C, 252°C) B) [122°C, 252°C]

C) (10°C, 50°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) (42, 92] B) (32, 82] 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) [38, 88] B) [54, 84] C) [38, 88) D) [54, 84)

Answer: D

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) [5, 8] B) [1, 5] C) [1, 8] D) [21, 24]

Answer: A

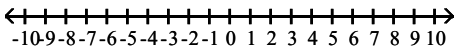
626) The formula $C = 0.5x + 20$ represents the estimated future cost of yearly attendance at State University, where C is the cost in thousands of dollars x years after 2002. Use a compound inequality to determine when the attendance costs will range from 24 to 26 thousand dollars.

A) From 2,011 to 2,015 B) From 2,009 to 2,013 C) From 2,010 to 2,014 D) From 2,011 to 2,013

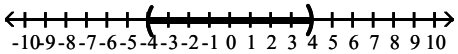
Answer: C

Solve the absolute value inequality. Other than ∅, use interval notation to express the solution set and graph the solution set on a number line.

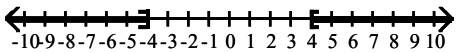
627) $|x| < 4$



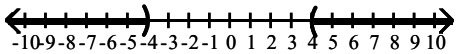
A) (–4, 4)



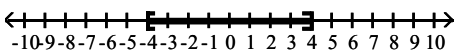
B) (–∞, –4] ∪ [4, ∞)



C) (–∞, –4) ∪ (4, ∞)

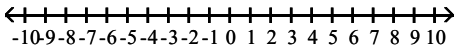


D) [–4, 4]

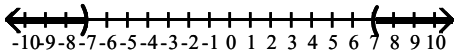


Answer: A

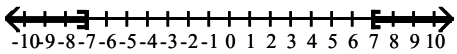
628) $|x| > 7$



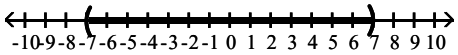
A) (–∞, –7) ∪ (7, ∞)



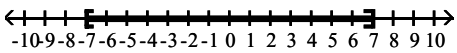
B) (–∞, –7] ∪ [7, ∞)



C) (–7, 7)

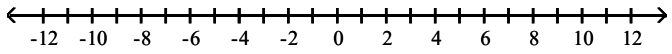


D) [–7, 7]

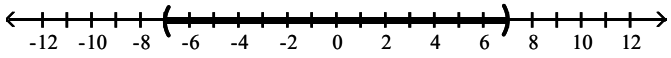


Answer: A

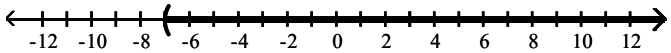
629) $|x - 7| < 0$



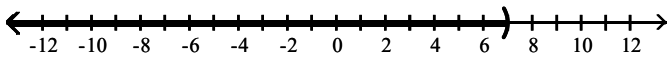
A) (–7, 7)



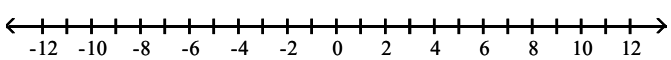
B) (–7, ∞)



C) (–∞, 7)

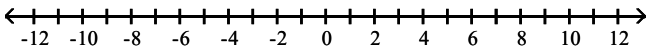


D) ∅

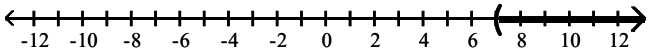


Answer: D

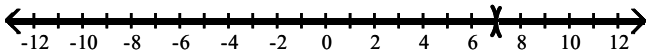
630) $|x - 7| > 0$



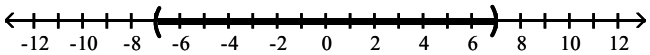
A) $(7, \infty)$



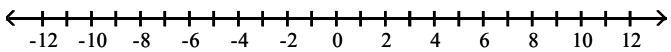
B) $(-\infty, 7) \cup (7, \infty)$



C) $(-7, 7)$

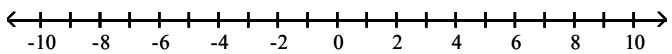


D) $\varnothing$

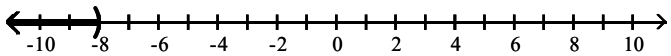


Answer: B

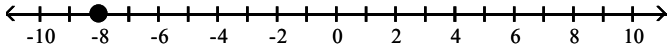
631) $|x + 8| \leq 0$



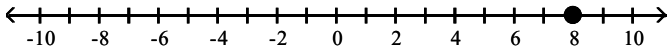
A) $(-\infty, -8)$



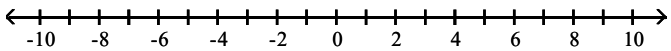
B) $\{-8\}$



C) $\{8\}$

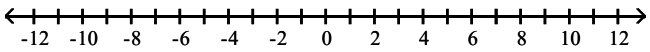


D) $\varnothing$

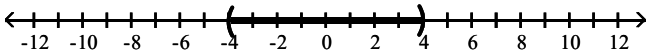


Answer: B

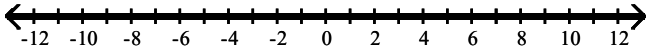
632) $|x + 4| \geq 0$



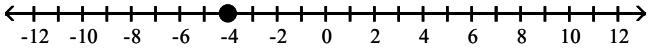
A) (–4, 4)



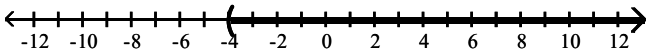
B) (–∞, ∞)



C) {–4}

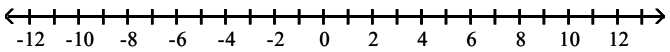


D) (–4, ∞)

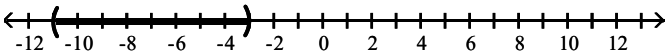


Answer: B

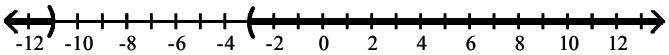
633) $|x + 7| < 4$



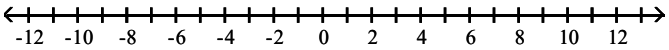
A) (–11, –3)



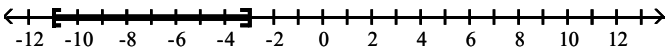
B) (–∞, –11) ∪ (–3, ∞)



C) ∅

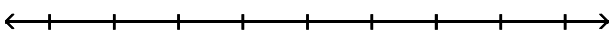


D) [–11, –3]

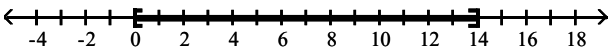


Answer: A

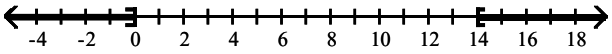
634) $|x - 7| - 6 \leq 1$



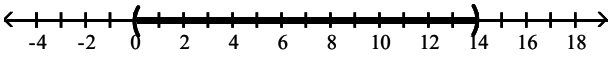
A) [0, 14]



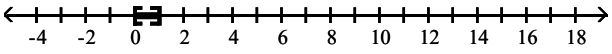
B) $(-\infty, 0] \cup [14, \infty)$



C) (0, 14)

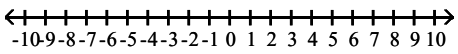


D) [0, 1]

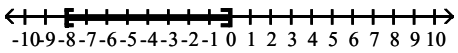


Answer: A

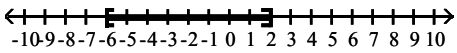
635) $|\,3(x + 1) + 9\,| \leq 12$



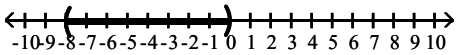
A) [–8, 0]



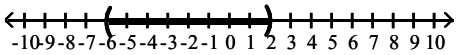
B) [–6, 2]



C) (–8, 0)

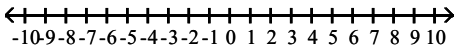


D) (–6, 2)

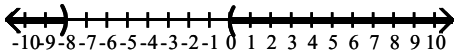


Answer: A

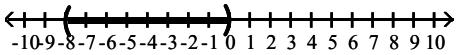
636) $\left|\dfrac{3y + 12}{4}\right| < 3$



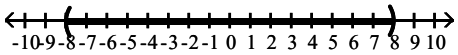
A) $(-\infty, -8) \cup (0, \infty)$



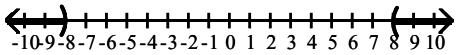
B) (–8, 0)



C) (–8, 8)

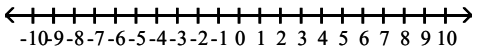


D) $(-\infty, -8) \cup (8, \infty)$

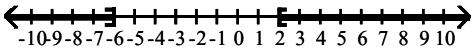


Answer: B

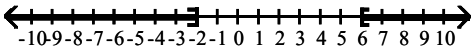
637) $8 + \left|1 - \frac{x}{2}\right| \geq 10$



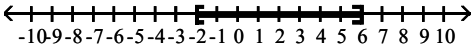
A) $(-\infty, -6] \cup [2, \infty)$



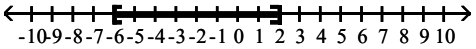
B) $(-\infty, -2] \cup [6, \infty)$



C) $[-2, 6]$

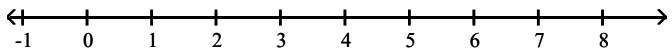


D) $[-6, 2]$

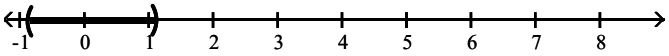


Answer: B

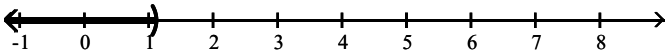
638) $|8x - 1| + 3 < -5$



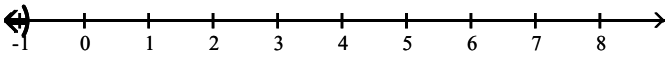
A) $\left(-\frac{7}{8}, \frac{9}{8}\right)$



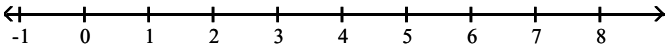
B) $\left(-\infty, \frac{9}{8}\right)$



C) $\left(-\infty, -\frac{7}{8}\right)$

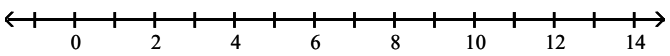


D) $\varnothing$

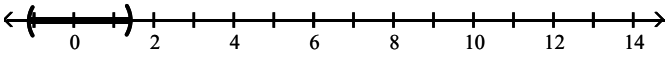


Answer: D

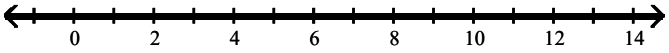
639) $|7x - 1| + 1 > -8$



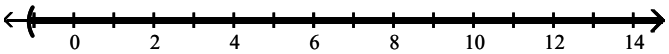
A) $\left(-\frac{8}{7}, \frac{10}{7}\right)$



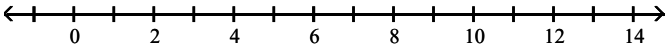
B) $(-\infty, \infty)$



C) $\left(-\frac{8}{7}, \infty\right)$



D) $\varnothing$



Answer: B

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 6 and 14 outcomes
B) Fewer than 6 or more than 14 outcomes
C) Fewer than 9 or more than 17 outcomes
D) Between 9 and 17 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: B

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) $|40 + x| \leq 0.75$; [39.25, 40.75]
B) $|x + 0.75| \leq 40$; [39.25, ∞)
C) $|40 - x| \leq 0.75$; [39.25, 40.75]
D) $|x| - 40 \leq 0.75$; (-∞, 40.75]

Answer: C

Answer Key
Testname: UNTITLED1

1) C
2) A
3) A
4) A
5) B
6) C
7) D
8) B
9) A
10) B
11) C
12) B
13) A
14) B
15) C
16) A
17) C
18) D
19) C
20) A
21) C
22) D
23) D
24) D
25) B
26) C
27) C
28) A
29) A
30) A
31) B
32) A
33) B
34) A
35) B
36) B
37) A
38) B
39) D
40) B
41) C
42) B
43) A
44) D
45) C
46) B
47) A
48) A
49) B
50) A

Answer Key
Testname: UNTITLED1

51) D
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53) A
54) C
55) D
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57) D
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80) D
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84) D
85) C
86) B
87) D
88) B
89) C
90) D
91) C
92) D
93) D
94) D
95) D
96) A
97) A
98) C
99) B
100) A

Answer Key
Testname: UNTITLED1

101) D
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103) A
104) B
105) B
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193) D
194) D
195) B
196) A
197) D
198) C
199) A
200) B

Answer Key
Testname: UNTITLED1

201) A
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243) D
244) C
245) C
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247) B
248) B
249) C
250) B

Answer Key
Testname: UNTITLED1

251) C
252) B
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254) B
255) D
256) C
257) C
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288) D
289) A
290) B
291) B
292) A
293) B
294) D
295) B
296) C
297) C
298) D
299) C
300) C

Answer Key
Testname: UNTITLED1

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343) A
344) A
345) B
346) C
347) D
348) C
349) B
350) B

Answer Key
Testname: UNTITLED1

351) A
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355) A
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394) B
395) C
396) D
397) A
398) D
399) B
400) D

Answer Key
Testname: UNTITLED1

401) D
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499) C
500) A

Answer Key
Testname: UNTITLED1

501) C
502) A
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504) D
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515) C
516) D
517) C
518) D
519) A
520) A
521) B
522) C
523) C
524) C
525) D
526) C
527) A
528) C
529) B
530) C
531) C
532) A
533) D
534) D
535) A
536) C
537) A
538) D
539) C
540) B
541) B
542) A
543) A
544) A
545) A
546) B
547) B
548) D
549) D
550) C

Answer Key
Testname: UNTITLED1

551) A
552) C
553) A
554) D
555) B
556) C
557) B
558) B
559) D
560) B
561) A
562) C
563) D
564) B
565) A
566) D
567) B
568) A
569) D
570) D
571) B
572) B
573) D
574) A
575) C
576) C
577) A
578) B
579) B
580) C
581) B
582) B
583) D
584) B
585) D
586) B
587) C
588) C
589) B
590) C
591) C
592) C
593) D
594) D
595) B
596) D
597) B
598) A
599) C
600) D

Answer Key
Testname: UNTITLED1

601) A
602) C
603) D
604) D
605) C
606) D
607) A
608) D
609) A
610) A
611) D
612) B
613) A
614) D
615) C
616) D
617) C
618) A
619) D
620) B
621) C
622) D
623) D
624) D
625) A
626) C
627) A
628) A
629) D
630) B
631) B
632) B
633) A
634) A
635) A
636) B
637) B
638) D
639) B
640) B
641) B
642) C