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

Determine whether the equation in one variable is linear.

1) $x - 2 = 12$
A) linear B) not linear
Answer: A

2) $x^2 - 2 = 9$
A) linear B) not linear
Answer: B

3) $\frac{6}{x} = 10$
A) linear B) not linear
Answer: B

4) $7x + 15 = 21$
A) linear B) not linear
Answer: A

5) $\frac{x}{11} + 26 = 15$
A) linear B) not linear
Answer: A

6) $\sqrt{2}x + \pi = 0.\overline{6}$
A) linear B) not linear
Answer: A

7) $6\sqrt{x} - 3 = 0$
A) linear B) not linear
Answer: B

8) $72.9x = 8.4$
A) linear B) not linear
Answer: A

9) $3(x - 4) = 0$
A) linear B) not linear
Answer: A

10) $|x + 2| = 6$
A) linear B) not linear
Answer: B

11) $|14x| - 29 = 26$
A) linear B) not linear
Answer: B

12) $2x = 5x^3$

A) linear B) not linear

Answer: B

Solve the equation.

13) $a - 13 = -2$

A) {11} B) {15} C) {–11} D) {–15}

Answer: A

14) $x + 5 = -18$

A) {23} B) {–23} C) {–13} D) {13}

Answer: B

15) $x + 15 = 8$

A) {–23} B) {–7} C) {23} D) {7}

Answer: B

16) $11 = b - 19$

A) {8} B) {30} C) {–8} D) {–30}

Answer: B

17) $-19 = b - 11$

A) {8} B) {–8} C) {–30} D) {30}

Answer: B

18) $-1 + s = 15$

A) {14} B) {16} C) {–14} D) {–16}

Answer: B

19) $\frac{1}{2} + x = 3$

A) $\left\{\frac{5}{2}\right\}$ B) $\{1\}$ C) {5} D) $\left\{\frac{7}{2}\right\}$

Answer: A

20) $x + \frac{1}{6} = \frac{5}{6}$

A) $\left\{\frac{4}{5}\right\}$ B) $\left\{\frac{2}{3}\right\}$ C) $\left\{\frac{1}{2}\right\}$ D) {1}

Answer: B

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

A) $\left\{-\frac{1}{2}\right\}$ B) $\left\{-\frac{1}{3}\right\}$ C) $\left\{-\frac{3}{4}\right\}$ D) $\left\{-\frac{7}{8}\right\}$

Answer: C

22) $x - \frac{1}{4} = \frac{1}{16}$

A) $\left\{\frac{5}{16}\right\}$ B) $\left\{-\frac{5}{16}\right\}$ C) $\left\{-\frac{21}{64}\right\}$ D) $\left\{-\frac{1}{8}\right\}$

Answer: A

23) $-\frac{1}{2} + z = \frac{3}{8}$

A) $\left\{-\frac{7}{8}\right\}$ B) $\left\{\frac{1}{2}\right\}$ C) $\left\{\frac{7}{8}\right\}$ D) $\left\{\frac{2}{5}\right\}$

Answer: C

24) $2.1 + x = 17.6$

A) {19.2} B) {15} C) {19.7} D) {15.5}

Answer: D

25) $-23.4 - x = 15.6$

A) {–39} B) {7.8} C) {–7.8} D) {39}

Answer: A

26) $13 + 9p = 10p$

A) {–6} B) {9} C) {–13} D) {13}

Answer: D

27) $9y = 8y - 2.6$

A) {2.6} B) {–2.6} C) {–19.6} D) {9}

Answer: B

28) $14x - 9 = 6x + 15$

A) {4} B) {3} C) {1} D) {6}

Answer: B

29) $15x - 4 - 9x = 26$

A) {5} B) {3} C) {6} D) {8}

Answer: A

30) $4(y + 7) = 5(y - 4)$

A) {8} B) {–8} C) {–48} D) {48}

Answer: D

31) $2(2z - 5) = 3(z + 5)$

A) {7} B) {25} C) {5} D) {–5}

Answer: B

32) $10y = 4y + 4 + 5y$

A) {–40} B) {4} C) {40} D) {–4}

Answer: B

33) $-5a + 5 + 6a = 13 - 26$

A) {−44} B) {44} C) {18} D) {−18}

Answer: D

34) $-6b + 3 + 4b = -3b + 8$

A) {8} B) {−3} C) {−8} D) {5}

Answer: D

35) $-8.2 + 4x - 6.3 + 5x - 2.1 = 5.7 + 10x + 1.3$

A) {−23.6} B) {9.6} C) {−9.6} D) {23.6}

Answer: A

Use the given information to write an equation. Let x represent the number described in the exercise. Then solve the equation and find the number.

36) The sum of a number and forty−four is fifty.

A) $44x = 50$; 1.14 B) $x \div 44 = 50$; 2200 C) $x + 44 = 50$; 6 D) $x - 44 = 50$; 94

Answer: C

37) Twenty−nine increased by a number equals fifty−two.

A) $29 + x = 52$; 23 B) $29 - x = 52$; −23 C) $29 + 52 = x$; 81 D) $29x = 52$; 1.79

Answer: A

38) If 239 is subtracted from a number, the result is 715.

A) $x - 239 = 715$; −954 B) $x + 715 = 239$; −476

C) $x - 239 = 715$; 954 D) $x + 239 = 715$; 476

Answer: C

39) If 251 is added to a number, the result is 484.

A) $x - 251 = 484$; 735 B) $251 + x = 484$; −735 C) $251 + x = 484$; 233 D) $x + 251 = 484$; −233

Answer: C

Solve.

40) The cost of having a car towed is given by the formula $C = 3x + 50$, where C is in dollars and x is the number of miles the car is towed. Find the cost of having a car towed 14 miles.

A) $53 B) $92 C) $42 D) $82

Answer: B

41) The monthly cost of a certain long distance service is given by the formula $C = 0.08t + 6.95$ where C is in dollars and t is the amount of time in minutes called in a month. Find the cost of calling long distance for 160 minutes in a month.

A) $19.75 B) $22.95 C) $18.75 D) $12.80

Answer: A

42) The amount of water in a leaky bucket is given by the formula $f = 125 - 8t$, where f is in ounces and t is in minutes. Find the amount of water in the bucket after 2 minutes.

A) 109 oz B) 117 oz C) 141 oz D) 16 oz

Answer: A

43) The altitude above sea level of an airplane just after taking off from an airport on a high plateau is given by the formula h = 700t + 3182, where h is in feet and t is the time in minutes since take–off. Find the altitude of the airplane after 9 minutes.

A) 9482 ft B) 9382 ft C) 9582 ft D) 6300 ft

Answer: A

Solve the equation using the multiplication property of equality.

44) $\frac{1}{16}a = 0$

A) {16} B) {1} C) {0} D) {–16}

Answer: C

45) $\frac{n}{4} = 5$

A) {1} B) {20} C) {9} D) {8}

Answer: B

46) $-\frac{n}{3} = -2$

A) {6} B) {–6} C) {–5} D) {5}

Answer: A

47) $\frac{v}{-4} = 4$

A) {–16} B) {8} C) {–8} D) {16}

Answer: A

48) 8x = 48

A) {384} B) {6} C) {40} D) $\left\{\frac{1}{6}\right\}$

Answer: B

49) 11x = 0

A) {11} B) {0} C) {1} D) {–11}

Answer: B

50) 7a = –56

A) {63} B) {1} C) {–8} D) {–63}

Answer: C

51) –8x = –56

A) {2} B) {48} C) {7} D) {–48}

Answer: C

52) – 42x = 36

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

Answer: B

53) $\frac{1}{9}x = -8$

A) {–1} B) {–72} C) {0} D) {1}

Answer: B

54) $56 = -\frac{8}{9}x$

A) {– 63} B) $\left\{-\frac{448}{9}\right\}$ C) $\left\{-\frac{512}{9}\right\}$ D) $\left\{-\frac{496}{9}\right\}$

Answer: A

55) $\frac{3}{4}x = 21$

A) $\left\{\frac{87}{4}\right\}$ B) {28} C) $\left\{\frac{63}{4}\right\}$ D) $\left\{\frac{81}{4}\right\}$

Answer: B

56) $\frac{2}{9}x = -\frac{4}{9}$

A) {– 4} B) {2} C) $\left\{-\frac{1}{2}\right\}$ D) {– 2}

Answer: D

57) $8x + x = 72$

A) {7} B) {9} C) {8} D) $\left\{\frac{73}{8}\right\}$

Answer: C

58) $-11x + x = -80$

A) {–8} B) {9} C) {8} D) {–9}

Answer: C

59) $3x + 19x = 15$

A) $\left\{\frac{22}{15}\right\}$ B) {330} C) $\left\{\frac{15}{22}\right\}$ D) {–7}

Answer: C

Solve the equation.

60) $-z = -5$

A) {–1} B) {–5} C) {0} D) {5}

Answer: D

61) $-x = -14$

A) {–1} B) {14} C) {–14} D) {0}

Answer: B

Solve the equation using both the addition and multiplication properties of equality.

62) $8r + 10 = 34$

A) {20} B) {16} C) {5} D) {3}

Answer: D

63) $5n - 8 = 37$

A) {15} B) {44} C) {40} D) {9}

Answer: D

64) $-13 = 7x + 1$

A) {−2} B) {−21} C) {2} D) {−17}

Answer: A

65) $-12 = -2x + 8$

A) {−18} B) {−14} C) {10} D) {2}

Answer: C

66) $-2x - 25 = -57$

A) {−30} B) {−16} C) {16} D) $\{41\}$

Answer: C

67) $-3 = -3x + 6$

A) {3} B) {10} C) {−3} D) {6}

Answer: A

68) $-4x = 66 + 7x$

A) {−6} B) {77} C) {−5} D) {6}

Answer: A

69) $10y - 35 = 5y$

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

Answer: D

70) $-10y + 21 = -3y$

A) $\left\{-\frac{21}{13}\right\}$ B) {3} C) {−3} D) $\left\{\frac{21}{13}\right\}$

Answer: B

71) $12x - 7 = 4x + 17$

A) {6} B) {3} C) {4} D) {1}

Answer: B

72) $-10y + 4 = -10 + 9y$

A) $\left\{\frac{19}{14}\right\}$ B) $\left\{\frac{14}{19}\right\}$ C) $\left\{-\frac{19}{14}\right\}$ D) $\left\{\frac{1}{6}\right\}$

Answer: B

73) $5x - 8 = 56 - 3x$

A) $\{32\}$ B) $\{24\}$ C) $\{-8\}$ D) $\{8\}$

Answer: D

74) $6x - 3x - 3 = -2x$

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

Answer: D

Use the given information to write an equation. Let x represent the number described in the exercise. Then solve the equation and find the number.

75) The product of three–fourths and a number is six.

A) $\frac{3}{4} + x = 6; \frac{21}{4}$ B) $\frac{3}{4} = 6x; \frac{1}{8}$ C) $\frac{3}{4} - x = 6; \frac{-21}{4}$ D) $\frac{3}{4}x = 6; 8$

Answer: D

76) If thirty is divided by a number, the result is five.

A) $\frac{30}{x} = 5; 6$ B) $30 - x = 5; 25$ C) $\frac{30}{5} = x; 6$ D) $\frac{x}{30} = 5; 150$

Answer: A

77) A number subtracted from eighteen is four.

A) $18 - x = 4; 14$ B) $x - 18 = 4; 22$ C) $18 - 4 = x; 14$ D) $18 + x = 4; -14$

Answer: A

Solve the problem.

78) The time it takes to travel a given distance at constant speed is given by the formula $t = \frac{d}{r}$, where t is the time, d is the distance, and r is the rate of travel. At 60 miles per hour, what distance can be traveled in 4 hours?

A) 120 mi B) 48 mi C) 240 mi D) 480 mi

Answer: C

79) The time it takes to travel a given distance at constant speed is given by the formula $t = \frac{d}{r}$, where t is the time, d is the distance, and r is the rate of travel. At 0.7 mile per minute, what distance can be traveled in 30 minutes?

A) 42 mi B) 4.2 mi C) 10.5 mi D) 21 mi

Answer: D

80) To convert meters to feet, you can use the formula $f = \frac{m}{0.3038}$, where f is the distance in feet and m is the distance in meters. How many meters (to the nearest tenth) is 24 feet?

A) 7.3 m B) 72.9 m C) 79.0 m D) 7.9 m

Answer: A

81) Power is the time rate of doing work and is commonly measured in watts. Power is given by the formula $P = \frac{W}{t}$, where P is power, W is work (in joules), and t is time in seconds. If 800 watts of power are used in 27 seconds, how much work (in joules) was done?

A) 3 joules B) 2160 joules C) 30 joules D) 21,600 joules

Answer: D

82) The speed of a ball dropped from a tower is given by the formula f = 32t where f is in feet per second and t is the number of seconds since the ball was dropped. Find the speed of the ball after 10 seconds.

A) 320 ft/sec B) 32 ft/sec C) 310 ft/sec D) 10 ft/sec

Answer: A

83) The formula C = 502x + 168 models the data for the cost to produce x units of a product, where C is given in dollars. How many units can be produced for a cost of $451,968?

A) 900 units B) 450 units C) 675 units D) 1800 units

Answer: A

84) The weekly production cost C of manufacturing x calendars is given by C = 21 + 2x, where the variable C is in dollars. What is the cost of producing 294 calendars?

A) $588.00 B) $315.00 C) $609.00 D) $6176.00

Answer: C

Solve the equation.

85) $4 - 6x = 3x - 2x - 31$

A) $\left\{\frac{27}{5}\right\}$ B) {5} C) $\left\{\frac{31}{7}\right\}$ D) $\left\{\frac{31}{5}\right\}$

Answer: B

86) $5x - 10x - 2x = -12 - 30$

A) {6} B) $\left\{\frac{30}{7}\right\}$ C) {– 6} D) {– 10}

Answer: A

87) $-6a + 5 + 7a = 8 - 30$

A) {–43} B) {43} C) {27} D) {–27}

Answer: D

88) $-6b + 7 + 4b = -3b + 12$

A) {–7} B) {–12} C) {5} D) {12}

Answer: C

89) $5x - 5 + 2x = 7x + 11 - 8x$

A) {1} B) {4} C) {2} D) {3}

Answer: C

90) $-7(x + 2) = -49$

A) {–47} B) {–51} C) {9} D) {5}

Answer: D

91) $6(2x - 1) = 24$

A) $\left\{\frac{23}{12}\right\}$ B) $\left\{\frac{25}{12}\right\}$ C) $\left\{\frac{3}{2}\right\}$ D) $\left\{\frac{5}{2}\right\}$

Answer: D

92) $7x - (5x + 4) = 10$

A) {6} B) {8} C) {9} D) {7}

Answer: D

93) $2(4t - 6) - 6 = 22$

A) {6} B) {7} C) {4} D) {5}

Answer: D

94) $3x + 6 = 4(x + 2)$

A) {14} B) {–2} C) {–14} D) {2}

Answer: B

95) $4(5x + 1) + 23 = 14x - 3$

A) {–180} B) {–5} C) {5} D) {–30}

Answer: B

96) $3(y + 3) = 4(y - 5)$

A) {–29} B) {11} C) {–11} D) {29}

Answer: D

97) $3(2z - 4) = 5(z + 5)$

A) {37} B) {16} C) {13} D) {–13}

Answer: A

98) $-3x - 4 + 4(x + 1) = -7x + 1$

A) $\left\{-\frac{7}{10}\right\}$ B) $\left\{-\frac{3}{4}\right\}$ C) $\left\{\frac{1}{8}\right\}$ D) {–7}

Answer: C

99) $3(3x - 2) - 12 = 4x - 3$

A) {3} B) {75} C) {–3} D) {15}

Answer: A

100) $5 - 8(y + 7) = 6 - 7y$

A) $\{55\}$ B) $\{6\}$ C) $\{-57\}$ D) $\{3\}$

Answer: C

101) $7(x + 2) + 12 = 3(x + 6) + 8$

A) {0} B) {18} C) {12} D) {15}

Answer: A

102) $5 - 3(x + 2) = 6 - 4(x + 1)$

A) {3} B) {13} C) {5} D) {9}

Answer: A

103) $-29 - (3y - 1) = 2(y - 2) + 3y$

A) $\left\{-\frac{1}{3}\right\}$ B) $\left\{-\frac{7}{2}\right\}$ C) {–3} D) $\{-12\}$

Answer: C

104) $2x + 3(-2x - 4) = -7 - 9x$

A) {1} B) $\left\{\frac{19}{13}\right\}$ C) {– 1} D) $\left\{-\frac{19}{5}\right\}$

Answer: A

105) $\frac{f}{3} - 4 = 1$

A) {–15} B) {15} C) {9} D) {–9}

Answer: B

106) $\frac{a}{3} - \frac{1}{3} = -5$

A) {–14} B) {16} C) {14} D) {–16}

Answer: A

107) $\frac{2x}{5} - \frac{x}{3} = 3$

A) {–90} B) {90} C) {45} D) {–45}

Answer: C

108) $\frac{1}{4}x - \frac{3}{8}x = 2$

A) {16} B) {–14} C) {14} D) {–16}

Answer: D

109) $\frac{5}{6} + \frac{1}{7}x = 1$

A) $\left\{\frac{7}{6}\right\}$ B) $\left\{-\frac{14}{3}\right\}$ C) $\left\{-\frac{24}{7}\right\}$ D) $\left\{-\frac{7}{6}\right\}$

Answer: A

110) $\frac{x}{4} - \frac{x}{5} = 2$

A) $\{40\}$ B) {10} C) {20} D) {8}

Answer: A

111) $\frac{x}{9} = \frac{x}{5} + \frac{8}{9}$

A) $\left\{-\frac{1}{10}\right\}$ B) {0} C) $\left\{-\frac{8}{9}\right\}$ D) $\{-10\}$

Answer: D

112) $\frac{4}{5} - \frac{x}{3} = \frac{17}{15}$

A) $\{1\}$ B) $\left\{-\frac{5}{3}\right\}$ C) $\left\{\frac{5}{3}\right\}$ D) $\{-1\}$

Answer: D

113) $\frac{5}{4}x + \frac{1}{6} = \frac{7}{6}x$

A) {2} B) {–2} C) {–16} D) {16}

Answer: B

114) $\frac{x}{2} + 4 = \frac{x}{5} + 7$

A) $\{-10\}$ B) $\{10\}$ C) $\left\{\frac{9}{10}\right\}$ D) $\left\{-\frac{9}{10}\right\}$

Answer: B

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

A) $\left\{-\frac{23}{8}\right\}$ B) $\left\{\frac{3}{2}\right\}$ C) $\left\{\frac{1}{4}\right\}$ D) $\left\{-\frac{21}{8}\right\}$

Answer: D

116) $\frac{r}{3} + \frac{6}{3} = \frac{r}{6} + \frac{8}{6}$

A) {4} B) {–4} C) {3} D) {–12}

Answer: B

117) $\frac{x+8}{4} + \frac{x-2}{3} = \frac{23}{12}$

A) {0} B) {1} C) $\left\{\frac{17}{2}\right\}$ D) {23}

Answer: B

118) $1.1x + 37.6 = 5.8x$

A) {6.5} B) {8} C) {–42} D) {6.7}

Answer: B

119) $1.6 - 9.5x = -48.2 - 1.2x$

A) {6} B) {5.4} C) {–58} D) {5.2}

Answer: A

120) $1.2x - 3.3 = 0.7x + 1.15$

A) {8.89} B) {8.9} C) {–0.112} D) {8.811}

Answer: B

121) $0.88x + 0.92(10 - x) = 9$

A) {0.05} B) {5} C) {–0.05} D) {–5}

Answer: B

122) $0.02y + 0.14(5000 - y) = 0.13y$

A) {1750} B) {175} C) {8400} D) {2800}

Answer: D

123) $0.40x - 0.20(x + 20) = 0.40(20)$

A) {70} B) {30} C) {60} D) {50}

Answer: C

124) $0.45(x + 40) + 0.25(x + 20) = -19$

A) {60} B) {–60} C) {20} D) {–20}

Answer: B

Solve the equation. Use words or set notation to identify equations that have no solution, or equations that are true for all real numbers.

125) $6(x + 4) = 6x + 24$

A) ∅ B) {48}

C) {0} D) {x | x is a real number}

Answer: D

126) $7(x + 5) = 7x - 70$

A) ∅ B) {x | x is a real number}

C) {70} D) {0}

Answer: A

127) $-8x + 6 + 6x = -2x + 11$

A) {5} B) {–6}

C) {x | x is a real number} D) ∅

Answer: D

128) $9x + 8 + 5x + 5 = 5x + 9x + 10$

A) ∅ B) {x | x is a real number}

C) {160} D) {0}

Answer: A

129) $6(x + 6) + 44 = 8x - 2(x + 8)$

A) ∅ B) {28}

C) {x | x is a real number} D) {60}

Answer: A

130) $12(x - 3) = 6(2x + 5) - 66$

A) {0} B) {–36}

C) {x | x is a real number} D) ∅

Answer: C

131) $8(x + 1) = 26x + 26 - 18x - 18$

A) {0}
B) {1}
C) {x | x is a real number}
D) ∅

Answer: C

132) $7x + 6(x + 1) = 13(x + 1) - 7$

A) ∅
B) {1}
C) {x | x is a real number}
D) {0}

Answer: C

133) $7(x + 4) + 5 = 7x + 2$

A) {31}
B) {x | x is a real number}
C) ∅
D) {11}

Answer: C

134) $3(4x + 2) + 46 = 5x - 4$

A) ∅
B) {8}
C) {x | x is a real number}
D) {–8}

Answer: D

135) $\frac{x}{2} - 5 = \frac{x}{2}$

A) ∅
B) {x | x is a real number}
C) {5}
D) {0}

Answer: A

136) $\frac{1}{3}(6x - 9) = 6\left(\frac{1}{3}x - \frac{1}{2}\right) + 8$

A) $\{2\}$
B) {x | x is a real number}
C) ∅
D) {0}

Answer: C

137) $9x + 1 = 1 - x$

A) {0}
B) {x| x is a real number}
C) ∅
D) $\{\frac{9}{2}\}$

Answer: A

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

A) {x| x is a real number}
B) {0}
C) {30}
D) ∅

Answer: B

139) $\frac{1}{4}x - \frac{3}{8}x = 2$

A) $\varnothing$ B) $\{x \mid x \text{ is a real number}\}$

C) $\{-16\}$ D) $\{16\}$

Answer: C

Use the given information to write an equation. Let x represent the number described in the exercise. Then solve the equation and find the number.

140) Four times a number added to 7 times the number equals 44. Find the number.

A) $4(x + 7) = 44x;\ 0.7$ B) $4x + 7x = 44;\ 4$ C) $4x(7 + x) = 44;\ 6.3$ D) $4x - 7x = 44;\ -6.3$

Answer: B

141) When 2 times a number is subtracted from 7 times the number, the result is 35. Find the number.

A) $7x - 2x = 35;\ 7$ B) $2(x - 7) = 35x;\ 2.4$ C) $2x(7 - x) = 35;\ -7$ D) $2x + 7x = 35;\ 5$

Answer: A

142) If 3 times a number is added to –7, the result is equal to 10 times the number. Find the number.

A) $13x - 10x = 7;\ 1$ B) $10(3x - 7) = -7;\ -1$ C) $4x + (-7) = 10x;\ 1$ D) $3x + (-7) = 10x;\ -1$

Answer: D

143) Three–fourths of a number is $\frac{5}{6}$. Find the number in lowest terms.

A) $\frac{3}{4}x = \frac{5}{6};\ \frac{5}{8}$ B) $\frac{3}{4} + x = \frac{5}{6};\ \frac{1}{10}$ C) $\frac{3}{4}x = \frac{5}{6};\ \frac{20}{18}$ D) $\frac{3}{4}x = \frac{5}{6};\ \frac{10}{9}$

Answer: D

144) The sum of four times a number and 1 is equal to the difference of twice the number and 10. Find the number.

A) $4x + 1 = 2x + 10;\ \frac{9}{2}$ B) $4x + 1 = 2x - 10;\ \frac{11}{2}$

C) $4(x + 1) = 2x - 10;\ -7$ D) $4x + 1 = 2x - 10;\ -\frac{11}{2}$

Answer: D

Solve the problem.

145) Forensic scientists use the lengths of certain bones to calculate the height of a person. When the femur (the bone from the knee to the hip socket) is used, the following formula applies for men: $h = 69.09 + 2.24f$, where h is the height and f is the length of the femur (both in centimeters). Find the height of a man with a femur measuring 60 centimeters.

A) 4279.8 cm B) 129.09 cm C) 203.49 cm D) 4.06 cm

Answer: C

146) There is a formula that gives a correspondence between women's shoe sizes in the United States and those in Italy. The formula is $S = 2(x + 12)$, where S is the size in Italy and x is the size in the United States. What would be the US size for an Italian size of 34?

A) 10 B) 2.5 C) 5 D) 80

Answer: C

147) In one state, speeding fines are determined by the formula $F = 10(x - 70) + 75$, where F is the cost, in dollars, of the fine if a person is caught driving x miles per hour. If the fine comes to \$185, how fast was the person driving?

A) 79 mph B) 81 mph C) 91 mph D) 83 mph

Answer: B

148) To convert a Fahrenheit temperature to Celsius, one formula to use is $F = \frac{9}{5}C + 32$, where F is the Fahrenheit temperature (in degrees) and C is the Celsius temperature. What is the Celsius temperature (to the nearest degree) when Fahrenheit temperature is 50°?

A) 122° B) 24° C) 96° D) 10°

Answer: D

Solve the formula for the specified variable.

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

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

Answer: A

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

A) $h = \frac{S - 2\pi r^2}{2\pi r}$ B) $h = \frac{S}{2\pi r} - 1$ C) $h = S - r$ D) $h = 2\pi(S - r)$

Answer: A

151) $V = \frac{1}{3}Bh$ for h

A) $h = \frac{3V}{B}$ B) $h = \frac{B}{3V}$ C) $h = \frac{3B}{V}$ D) $h = \frac{V}{3B}$

Answer: A

152) $P = s_1 + s_2 + s_3$ for s_3

A) $s_3 = s_1 + s_2 - P$ B) $s_3 = s_1 + P - s_2$ C) $s_3 = P - s_1 - s_2$ D) $s_3 = P + s_1 + s_2$

Answer: C

153) $F = \frac{9}{5}C + 32$ for C

A) $C = \frac{F - 32}{9}$ B) $C = \frac{5}{F - 32}$ C) $C = \frac{5}{9}(F - 32)$ D) $C = \frac{9}{5}(F - 32)$

Answer: C

154) $d = rt$ for t

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

Answer: A

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

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

Answer: D

Solve the equation for y.

156) $4x + y = 20$

A) $y = \frac{20 - x}{4}$ B) $y = 5 - x$ C) $y = 20 - 4x$ D) $y = 4x + 20$

Answer: C

157) $19x + 7y = 11$

A) $y = \frac{11 - 19x}{7}$ B) $y = 19x - 11$ C) $y = \frac{19 + 11x}{7}$ D) $y = \frac{11 + 19x}{7}$

Answer: A

158) $x = 9y + 5$

A) $y = \frac{x - 5}{9}$ B) $y = x - \frac{5}{9}$ C) $y = \frac{1}{9}x - 5$ D) $y = 9x - 5$

Answer: A

159) $-4x + 16y = 0$

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

Answer: A

Use the percent formula, A = PB: A is P percent of B, to solve.

160) What number is 8% of 170?

A) 136 B) 1360 C) 1.36 D) 13.6

Answer: D

161) What number is 50% of 113?

A) 5.65 B) 56.5 C) 5650 D) 565

Answer: B

162) What number is 19% of 60?

A) 1140 B) 1.14 C) 11.4 D) 114

Answer: C

163) 68% of what number is 40.8?

A) 0.6 B) 27.744 C) 2774.4 D) 60

Answer: D

164) What percent of 100 is 2?

A) 200% B) 2% C) 20,000% D) 0.02%

Answer: B

165) 1296 is what percent of 324?
A) 25% B) 0.4% C) 4% D) 400%
Answer: D

166) 27% of what number is 43.2?
A) 16 B) 160 C) 1600 D) 1.6
Answer: B

167) What percent of 7.5 is 0.9?
A) 8% B) 1.2% C) 12% D) 120%
Answer: C

168) 75 is 20% of what number?
A) 3750 B) 37.5 C) 375 D) 15
Answer: C

169) 18 is 5% of what number?
A) 3600 B) 90 C) 36 D) 360
Answer: D

170) 50% of what number is 59?
A) 118 B) 11.8 C) 1180 D) 29.5
Answer: A

Solve the problem.

171) Jeans are on sale at the local department store for 20% off. If the jeans originally cost $56, find the sale price. (Round to the nearest cent, if necessary.)
A) $44.80 B) $54.88 C) $11.20 D) $67.20
Answer: A

172) Sales at a local ice cream shop went up 30% in 5 years. If 50,000 ice cream cones were sold in the current year, find the number of ice cream cones sold 5 years ago. (Round to the nearest integer, if necessary.)
A) 166,667 ice cream cones B) 35,000 ice cream cones
C) 38,462 ice cream cones D) 15,000 ice cream cones
Answer: C

173) Attendance this year at the homecoming football game is 138% of what it was last year. If last year's homecoming football game attendance was 37,000, what is this year's attendance? (Round to the nearest integer, if necessary.)
A) 3730 people B) 510,600 people C) 268 people D) 51,060 people
Answer: D

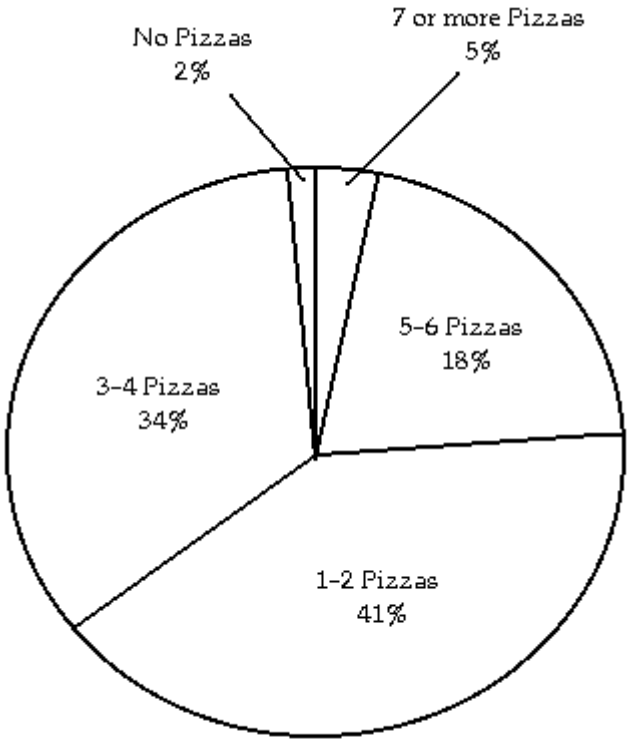
174) Of the 20 students in an algebra class, 8 of them received an F on the mid–term exam. What percent of the algebra students received an F on the exam? (Round to the nearest tenth of a percent, if necessary.)
A) 2.5% B) 400% C) 25% D) 40%
Answer: D

175) 15% of students at a university attended a lecture. If 4000 students are enrolled at the university, about how many students attended the lecture?

A) 6000 students B) 600 students C) 60,000 students D) 60 students

Answer: B

The pie chart below shows the number of pizzas consumed by college students in a typical month. Use the chart to answer the question.



176) What percent of college students consume 1–2 pizzas in a typical month?

A) 34% B) 41% C) 18% D) 2%

Answer: B

177) What percent of college students consume no pizzas in a typical month?

A) 18% B) 2% C) 5% D) 34%

Answer: B

178) What percent of college students consume 3 or more pizzas in a typical month?

A) 34% B) 52% C) 57% D) 98%

Answer: C

179) What percent of college students consume 4 pizzas or less in a typical month?

A) 75% B) 43% C) 82% D) 77%

Answer: D

180) If State University has approximately 25,000 students, about how many would you expect to consume 5–6 pizzas in a typical month?

A) 450 students B) 8500 students C) 4500 students D) 850 students

Answer: C

Solve the problem.

181) Due to a lack of funding, the number of students enrolled at City College went from 8000 last year to 3000 this year. Find the percent decrease in enrollment. (Round to the nearest tenth of a percent, if necessary.)

A) 266.7% B) 37.5% C) 166.7% D) 62.5%

Answer: D

182) If 5 is increased to 8, the increase is what percent of the original number?

A) 0.006% B) 0.6% C) 60% D) 6%

Answer: C

183) If 100 is decreased to 95, the decrease is what percent of the original number?

A) 5% B) 0.05% C) 0.5% D) 0.0005%

Answer: A

Let x represent the number. Write the English phrase as an algebraic expression.

184) The product of 6 and a number, added to 14.

A) 84x B) 84 + x C) 6 + 14x D) 14 + 6x

Answer: D

185) Five times a number, decreased by 19.

A) 5(x – 19) B) 5x + 19 C) 5(x + 19) D) 5x – 19

Answer: D

186) The quotient of 31 and the product of a number and –10.

A) $\frac{31}{x}$ – 10 B) –310x C) $\frac{-10x}{31}$ D) $\frac{31}{-10x}$

Answer: D

187) The product of –29 and the sum of a number and 17.

A) –493x B) –29x + 17 C) –29(x + 17) D) –29 + 17x

Answer: C

188) Twice the sum of a number and –16.

A) 2+ x + (–16) B) 2x – (–16) C) 2x + (–16) D) 2(x + (–16))

Answer: D

189) The quotient of 37 times a number and –3.

A) $\frac{1}{-111x}$ B) 37x – 3 C) $\frac{37x}{-3}$ D) 37x + 3

Answer: C

190) Eleven times a number decreased by one–third of the same number.

A) $11x - \frac{1}{3}$ B) $11x - \frac{x}{3}$ C) $\frac{x}{3} - 11x$ D) $11(x - \frac{1}{3})$

Answer: B

Let x represent the number. Use the given conditions to write an equation. Solve the equation and find the number.

191) Four times a number added to 7 times the number equals 55. Find the number.

A) $4x(7 + x) = 55; 7.9$ B) $4x + 7x = 55; 5$ C) $4(x + 7) = 55x; 0.5$ D) $4x - 7x = 55; -7.9$

Answer: B

192) When 5 times a number is subtracted from 7 times the number, the result is 22. Find the number.

A) $5x(7 - x) = 22; -11$ B) $5(x - 7) = 22x; 0.5$ C) $5x + 11x = 22; 2$ D) $7x - 5x = 22; 11$

Answer: D

193) If 5 times a number is added to –7, the result is equal to 12 times the number. Find the number.

A) $4x + (-7) = 12x; 1$ B) $17x - 12x = 7; 1$ C) $12(5x - 7) = -7; -1$ D) $5x + (-7) = 12x; -1$

Answer: D

194) Three–fourths of a number is $\frac{5}{6}$. Find the number in lowest terms.

A) $\frac{3}{4}x = \frac{5}{6}; \frac{5}{8}$ B) $\frac{3}{4}x = \frac{5}{6}; \frac{10}{9}$ C) $\frac{3}{4} + x = \frac{5}{6}; \frac{1}{10}$ D) $\frac{3}{4}x = \frac{5}{6}; \frac{20}{18}$

Answer: B

195) The sum of four times a number and 6 is equal to the difference of twice the number and 10. Find the number.

A) $4x + 6 = 2x + 10; 2$ B) $4x + 6 = 2x - 10; 8$

C) $4x + 6 = 2x - 10; -8$ D) $4(x + 6) = 2x - 10; -17$

Answer: C

Solve the problem.

196) 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 = $90,000; department head's salary = $45,000

C) president's salary = $13,500; department head's salary = $4500

D) president's salary = $45,000; department head's salary = $135,000

Answer: A

197) 30 marbles are to be divided into three bags so that the second bag has three times as many marbles as the first bag and the third bag has twice as many as the first bag. If x is the number of marbles in the first bag, find the number of marbles in each bag.

A) 1st bag = 6 marbles; 2nd bag = 18 marbles; 3rd bag = 12 marbles

B) 1st bag = 5 marbles; 2nd bag = 15 marbles; 3rd bag = 10 marbles

C) 1st bag = 6 marbles; 2nd bag = 14 marbles; 3rd bag = 10 marbles

D) 1st bag = 5 marbles; 2nd bag = 10 marbles; 3rd bag = 15 marbles

Answer: B

198) A promotional deal for long distance phone service charges a $15 basic fee plus $0.05 per minute for all calls. If Joe's phone bill was $73 under this promotional deal, how many minutes of phone calls did he make? Round to the nearest integer, if necessary.

A) 1160 minutes B) 12 minutes C) 1760 minutes D) 3 minutes

Answer: A

199) Two angles are complementary if their sum is 90°. If the measure of the first angle is x°, and the measure of the second angle is (3x – 2)°, find the measure of each angle.

A) 1st angle = 22°; 2nd angle = 64° B) 1st angle = 31°; 2nd angle = 59°

C) 1st angle = 22°; 2nd angle = 68° D) 1st angle = 23°; 2nd angle = 67°

Answer: D

200) Rooms in Dormitory A each have 132 square feet of floor space. These rooms have twice as much floor space as each room in Dormitory B. About how much floor space does a room in Dormitory B have?

A) 130 sq. feet B) 66 sq. feet C) 134 sq. feet D) 264 sq. feet

Answer: B

201) An isosceles triangle contains two angles of the same measure. If the measure of the third angle is 42° less than the measure of either of the other two identical angles, find the measure of one of the identical angles. (Hint: The sum of the angles of a triangle is 180°.)

A) 54° B) 74° C) 32° D) 111°

Answer: B

202) There are 14 more sophomores than juniors in an algebra class. If there are 82 students in this class, find the number of sophomores and the number of juniors in the class.

A) 96 sophomores; 68 juniors B) 34 sophomores; 48 juniors

C) 48 sophomores; 34 juniors D) 82 sophomores; 68 juniors

Answer: C

203) A car rental agency advertised renting a luxury, full–size car for $24.95 per day and $0.29 per mile. If you rent this car for 5 days, how many whole miles can you drive if you only have $200 to spend?

A) 586 miles B) 259 miles C) 23 miles D) 40 miles

Answer: B

204) A 10–ft. board is cut into 2 pieces so that one piece is 2 feet longer than 3 times the shorter piece. If the shorter piece is x feet long, find the lengths of both pieces.

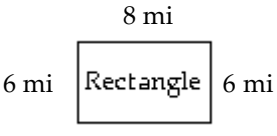
A) shorter piece: 28 ft; longer piece: 30 ft. B) shorter piece: 2 ft.; longer piece: 8 ft.

C) shorter piece: 6 ft; longer piece: 32 ft. D) shorter piece: 5 ft; longer piece: 30 ft.

Answer: B

Use a formula for perimeter or area to solve the problem.

205)

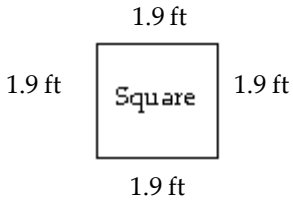


Find the perimeter of the figure.

A) 28 mi B) 4 mi C) 24 mi D) 14 mi

Answer: A

206)

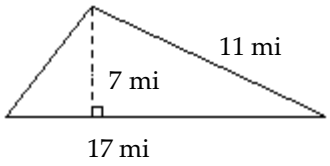


Find the perimeter of the figure.

A) 7.6 ft B) 7.22 ft C) 3.8 ft D) 17.6 ft

Answer: A

207)

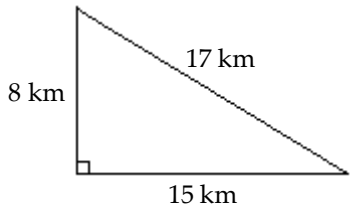


Find the area of the triangle.

A) 93.5 mi^2 B) 119 mi^2 C) 38.5 mi^2 D) 59.5 mi^2

Answer: D

208)

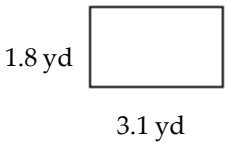


Find the area of the triangle.

A) 68 km^2 B) 40 km^2 C) 120 km^2 D) 60 km^2

Answer: D

209)

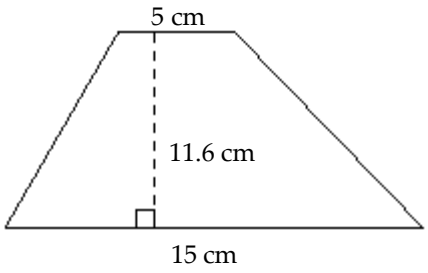


Find the area of the rectangle.

A) 55.8 yd^2 B) 9.8 yd^2 C) 4.9 yd^2 D) 5.58 yd^2

Answer: D

210)

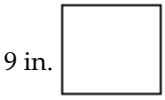


Find the area of the trapezoid.

A) 174 cm^2 B) 232 cm^2 C) 116 cm^2 D) 58 cm^2

Answer: C

211)

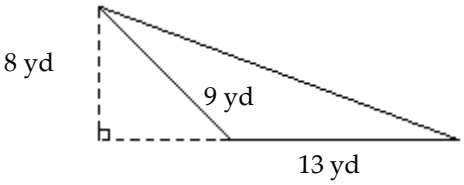


Find the area of the square.

A) 18 $in.^2$ B) 36 $in.^2$ C) 81 $in.^2$ D) 13 $in.^2$

Answer: C

212)



Find the area of the triangle.

A) 56 yd^2 B) 36 yd^2 C) 104 yd^2 D) 52 yd^2

Answer: D

213) The length of a rectangle is 121 in. and the width is 33 in. Find its perimeter.

A) 3993 in. B) 154 in. C) 308 in. D) 275 in.

Answer: C

214) The width of a room is 7 feet, and the area of the room is 105 square feet. Find the room's length.

A) $45\frac{1}{2}$ feet B) 735 feet C) 15 feet D) 98 feet

Answer: C

Solve.

215) To trim the edges of a rectangular table cloth, 60 feet of lace are needed. The length of the table cloth is exactly one–half its width. What are the dimensions of the table cloth?

A) length: 20 feet; width: 40 feet
B) length: 20 feet; width: 10 feet
C) length: 10 feet; width: 20 feet
D) length: 5 feet; width: 10 feet

Answer: C

216) A rectangular carpet has a perimeter of 262 inches. The length of the carpet is 89 inches more than the width. What are the dimensions of the carpet?

A) 120.5 by 131 inches
B) 76 by 97 inches
C) 110 by 131 inches
D) 110 by 21 inches

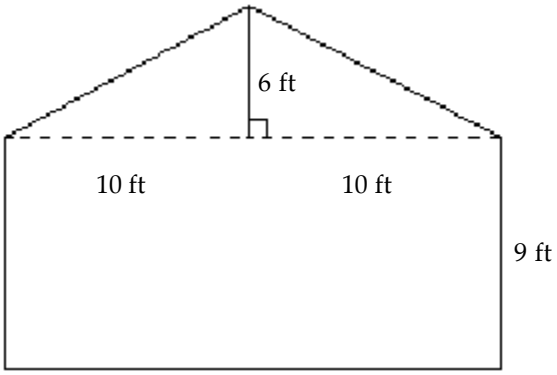
Answer: D

217) The length of a rectangular room is 8 feet longer than twice the width. If the room's perimeter is 184 feet, what are the room's dimensions?

A) Width = 28 ft; length = 64 ft
B) Width = 56 ft; length = 128 ft
C) Width = 33 ft; length = 74 ft
D) Width = 42 ft; length = 50 ft

Answer: A

218)

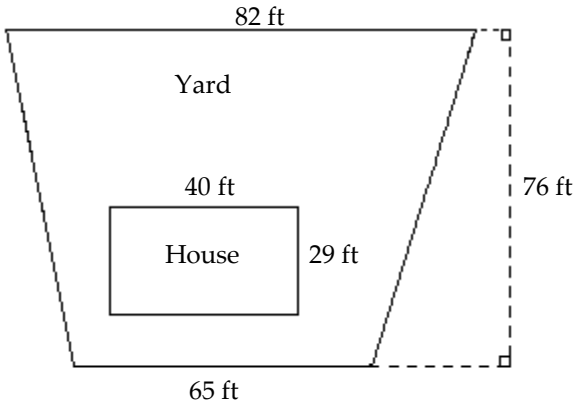


The drawing shows the end of a building that is to be bricked. If the area of the side of a brick used is $\frac{1}{6}$ sq. ft, find the number of bricks needed to completely cover the side of the building.

A) 40 bricks
B) 1440 bricks
C) 1800 bricks
D) 240 bricks

Answer: B

219)



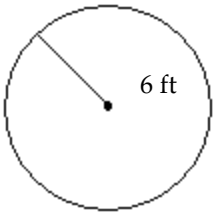
A homeowner wants to know how much grass seed to buy. First the size of the yard must be determined. Use the drawing to determine how many square feet are in the yard.

A) 5072 ft^2 B) 10,012 ft^2 C) 4426 ft^2 D) 5586 ft^2

Answer: C

Use the formula for the area or circumference of a circle to solve the problem. Where applicable, express answers in terms of π.

220)

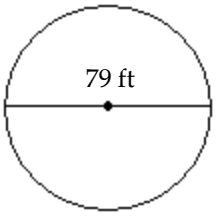


Find the area of the circle.

A) 36π ft^2 B) 10π ft^2 C) 12π ft^2 D) 24π ft^2

Answer: A

221)

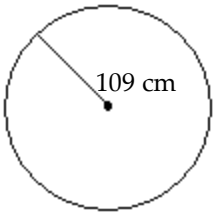


Give the exact circumference.

A) 158π ft B) 6241π ft C) 39.5π ft D) 79π ft

Answer: D

222)



Give the exact circumference.

A) 109π cm B) 11,881π cm C) 54.5π cm D) 218π cm

Answer: D

223) The circumference of a circle is 8π meters. Find the circle's radius.

A) 4π m B) 4 m C) π m D) 8 m

Answer: B

224) The circumference of a circle is 32π meters. Find the circle's diameter.

A) 16π m B) 16 m C) 32 m D) π m

Answer: C

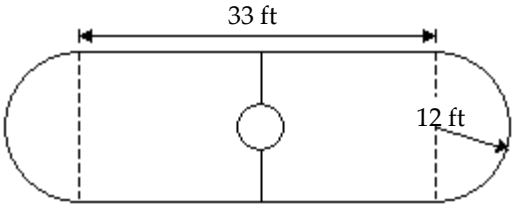
Solve.

225) Which one of the following is a better buy: a 16–inch pizza for $10 or two 8–inch pizzas for $9.

A) two 8–in. pizzas B) 16–in. pizza C) equivalent buys

Answer: B

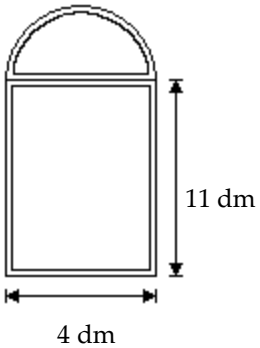
226) Find the area of the skating rink. Use π = 3.14 and round to the nearest tenth.



A) 1300.3 sq. ft B) 1696.3 sq. ft C) 1244.2 sq. ft D) 848.2 sq. ft

Answer: C

227) Find the area of the window. Use π = 3.14 and round to the nearest tenth.



A) 45.6 sq. dm B) 69.1 sq. dm C) 50.3 sq. dm D) 94.2 sq. dm

Answer: C

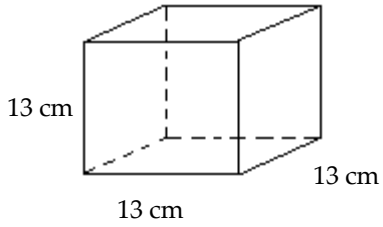
228) The rectangular part of the field shown below is 116 yd long and the diameter of each semicircle is 12 yd. Find the cost of fertilizing the field at \$0.45 per square yard. Use $\pi = 3.14$ and round to the nearest cent.

A) \$364.07 B) \$829.87 C) \$677.27 D) \$634.88

Answer: C

Find the volume of the figure. Where applicable, express answers in terms of π.

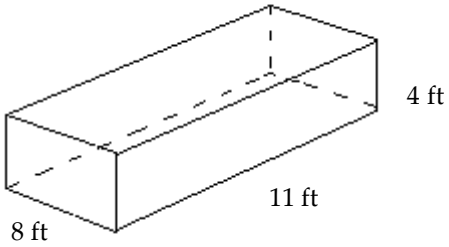
229)



A) 169 cm^3 B) 39 cm^3 C) 2197 cm^3 D) 338 cm^3

Answer: C

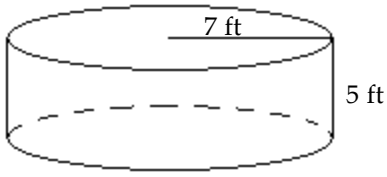
230)



A) 176 ft^3 B) 256 ft^3 C) 352 ft^3 D) 968 ft^3

Answer: C

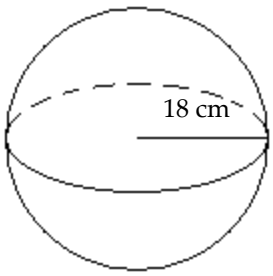
231)



A) 35π ft^3 B) 245 ft^3 C) 49π ft^3 D) 245π ft^3

Answer: D

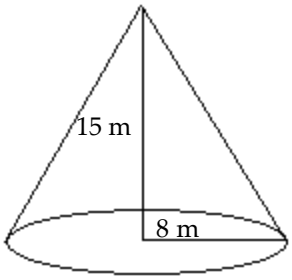
232)



A) 864π cm^3 B) 7776π cm^3 C) 5832π cm^3 D) $23{,}328\pi$ cm^3

Answer: B

233)



A) 40π m^3 B) 960π m^3 C) 320π m^3 D) 120π m^3

Answer: C

Solve.

234) A water reservoir is shaped like a rectangular solid with a base that is 5 meters by 7 meters, and a vertical height of 2 meters. How much water is in the reservoir if it is completely full?

A) 70 m^3 B) 245 m^3 C) 50 m^3 D) 28 m^3

Answer: A

235) Find the volume of an aluminum can that has a radius of 2.5 centimeters and a height of 14 centimeters. Use π = 3.14 and round to the nearest tenth.

A) 219.8 cm^3 B) 109.9 cm^3 C) 274.8 cm^3 D) 1099 cm^3

Answer: C

236) The outside of a water storage tank is in the shape of a sphere. If the radius is 15.4 feet, approximate the volume of the tank in cubic feet. Use π = 3.14 and round to the nearest hundredth, if necessary.

A) 992.91 ft^3 B) 11,468.11 ft^3 C) 15,290.81 ft^3 D) 744.68 ft^3

Answer: C

Use the relationship among the three angles of any triangle to solve the problem.

237) Two angles of a triangle are 10° and 30°. Find the third angle.

A) 40° B) 50° C) 140° D) 320°

Answer: C

238) Two angles of a triangle are 35° and 60°. Find the third angle.
A) 5° B) 85° C) 95° D) 265°
Answer: B

239) One of the base angles of an isosceles triangle is 35°. Find the measures of the other two angles. (An isosceles triangle has two equal base angles.)
A) 35°, 20° B) 35°, 290° C) 35°, 70° D) 35°, 110°
Answer: D

240) One angle of a triangle is 3 times as large as another. The measure of the third angle is 105° greater than that of the smallest angle. Find the measure of each angle.
A) 15°, 45°, 105° B) 25°, 75°, 80° C) 20°, 60°, 100° D) 15°, 45°, 120°
Answer: D

241) A triangle has angles of (4x)°, (3x + 8)°, and (2x + 19)°. Find the measure of each angle.
A) 53°, 51°, 68° B) 17°, 59°, 68° C) 17°, 53°, 68° D) 53°, 59°, 68°
Answer: D

Find the measure of the indicated angle.

242) Find the measure of the complement of 74°.
A) 196° B) 106° C) 286° D) 16°
Answer: D

243) Find the measure of the supplement of 54°.
A) 126° B) 216° C) 306° D) 36°
Answer: A

244) Find the measure of the supplement of 132°.
A) 138° B) 48° C) not possible D) 228°
Answer: B

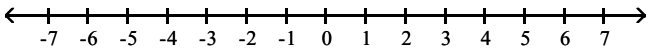
245) The angle's measure is 60° more than that of its complement.
A) 15° B) 60° C) 120° D) 75°
Answer: D

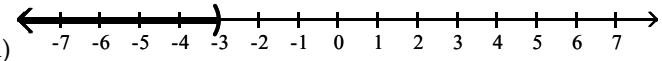
246) The angle's measure is 40° more than that of its supplement.
A) 65° B) 70° C) 110° D) 25°
Answer: C

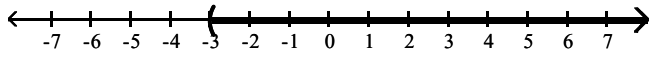
247) The angle's measure is 60° more than triple that of its supplement.
A) 120° B) 105° C) 150° D) 75°
Answer: C

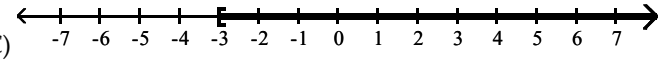
Graph the solution of the inequality on a number line.

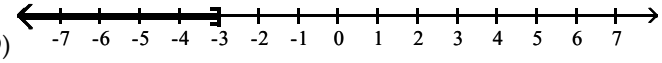
248) $x > -3$



A) 

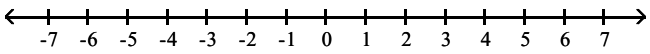
B) 

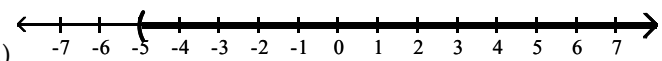
C) 

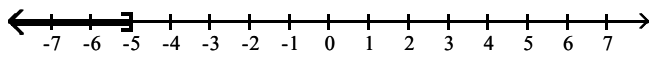
D) 

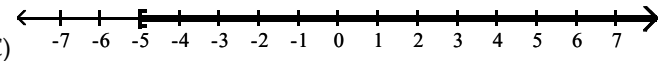
Answer: B

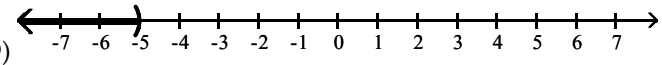
249) $x < -5$



A) 

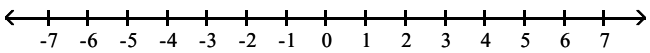
B) 

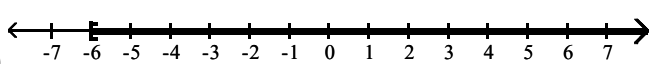
C) 

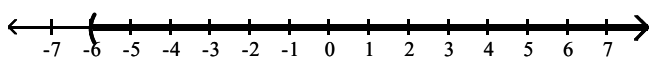
D) 

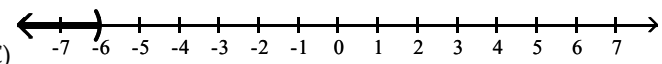
Answer: D

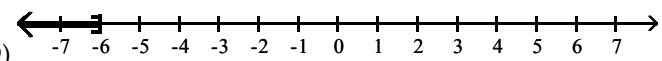
250) $x \geq -6$



A) 

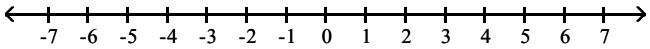
B) 

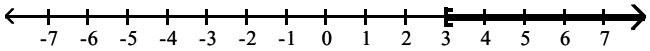
C) 

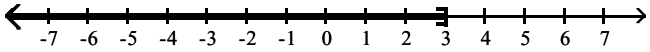
D) 

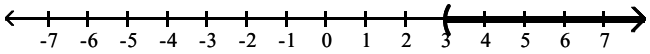
Answer: A

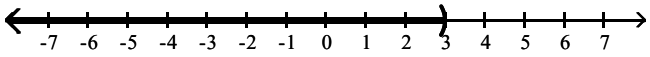
251) $x \leq 3$



A) 

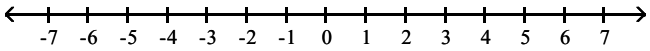
B) 

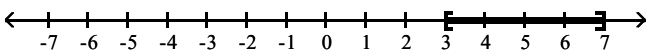
C) 

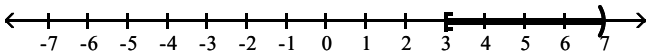
D) 

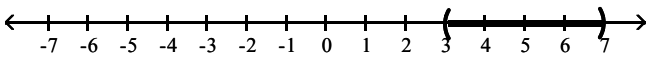
Answer: B

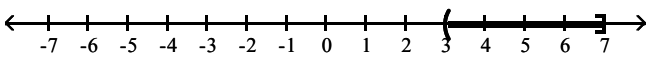
252) $3 \leq x \leq 7$



A) 

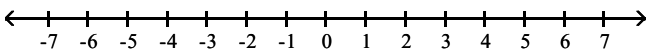
B) 

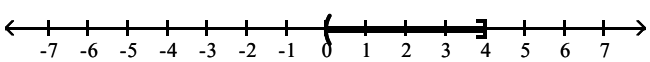
C) 

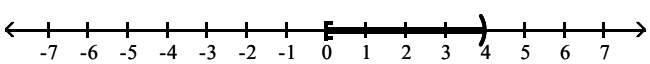
D) 

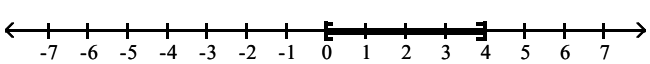
Answer: A

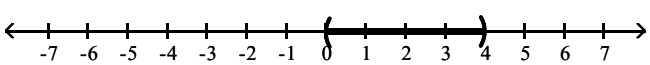
253) $0 < x < 4$



A) 

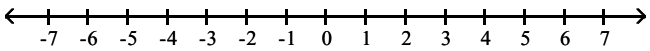
B) 

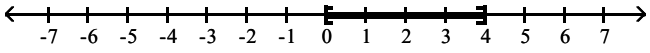
C) 

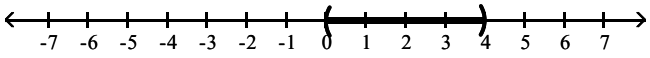
D) 

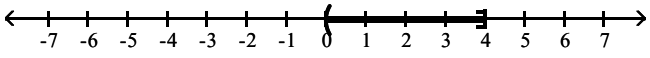
Answer: D

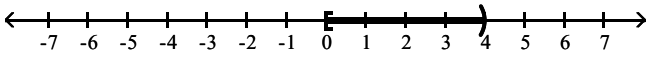
254) $0 \le x < 4$



A) 

B) 

C) 

D) 

Answer: D

Express the solution set of the inequality in interval notation.

255) $x \ge 3$

A) $(3, \infty)$ B) $(-\infty, 3)$ C) $[3, \infty)$ D) $(-\infty, 3]$

Answer: C

256) $x > 20$

A) $(-\infty, 20]$ B) $[20, \infty)$ C) $(-\infty, 20)$ D) $(20, \infty)$

Answer: D

257) $x > -8$

A) $(-8, \infty)$ B) $(-\infty, -8)$ C) $(-\infty, -8]$ D) $[-8, \infty)$

Answer: A

258) $x \ge -12$

A) $(-\infty, -12)$ B) $(-12, \infty)$ C) $(-\infty, -12]$ D) $[-12, \infty)$

Answer: D

259) $x < 8$

A) $(8, \infty)$ B) $(-\infty, 8]$ C) $[8, \infty)$ D) $(-\infty, 8)$

Answer: D

260) $x \le 20$

A) $(20, \infty)$ B) $(-\infty, 20)$ C) $(-\infty, 20]$ D) $[20, \infty)$

Answer: C

261) $x \le -9$

A) $(-9, \infty)$ B) $[-9, \infty)$ C) $(-\infty, -9)$ D) $(-\infty, -9]$

Answer: D

262) $x < -13$

A) $[-13, \infty)$ B) $(-13, \infty)$ C) $(-\infty, -13]$ D) $(-\infty, -13)$

Answer: D

263) $x < \frac{3}{8}$

A) $\left(\frac{3}{8}, \infty\right)$ B) $\left[\frac{3}{8}, \infty\right)$ C) $\left(-\infty, \frac{3}{8}\right)$ D) $\left(-\infty, \frac{3}{8}\right]$

Answer: C

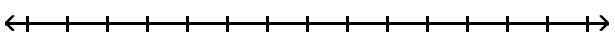
264) $x \geq \frac{2}{7}$

A) $\left(-\infty, \frac{2}{7}\right)$ B) $\left(-\infty, \frac{2}{7}\right]$ C) $\left(\frac{2}{7}, \infty\right)$ D) $\left[\frac{2}{7}, \infty\right)$

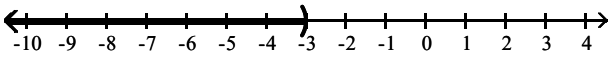
Answer: D

Use the addition property of inequality to solve the inequality and graph the solution set on a number line.

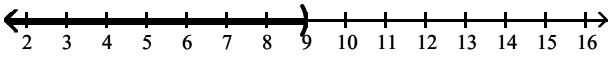
265) $x + 6 \leq 3$



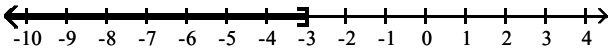
A) $(-\infty, -3)$



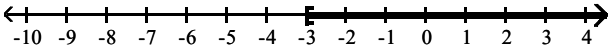
B) $(-\infty, 9)$



C) $(-\infty, -3]$

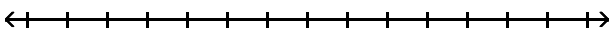


D) $[-3, \infty)$

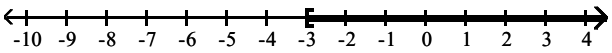


Answer: C

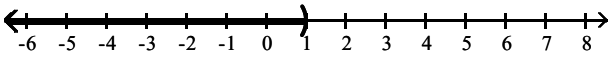
266) $x + 2 \geq -1$



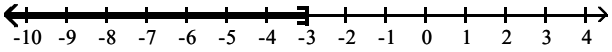
A) $[-3, \infty)$



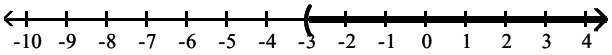
B) $(-\infty, 1)$



C) $(-\infty, -3]$

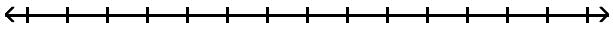


D) $(-3, \infty)$

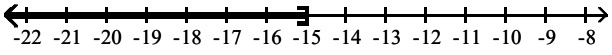


Answer: A

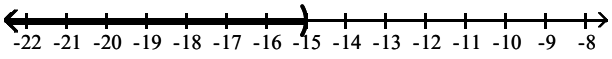
267) $x - 6 < -9$



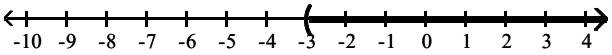
A) $(-\infty, -15]$



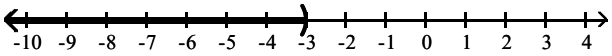
B) $(-\infty, -15)$



C) $(-3, \infty)$

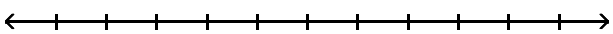


D) $(-\infty, -3)$

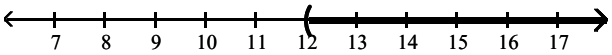


Answer: D

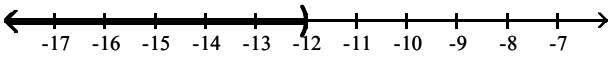
268) $8 - x > -4$



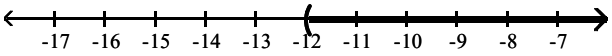
A) $(12, \infty)$



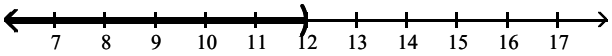
B) $(-\infty, -12)$



C) $(-12, \infty)$

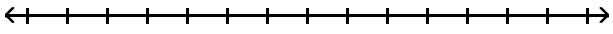


D) $(-\infty, 12)$

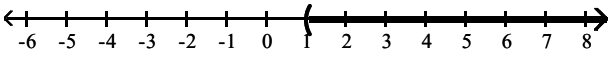


Answer: D

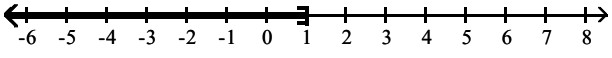
269) $3x - 4 > 2x - 3$



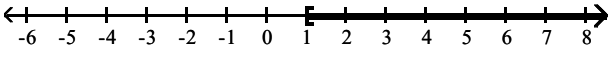
A) $(1, \infty)$



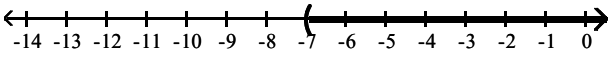
B) $(-\infty, 1]$



C) $[1, \infty)$

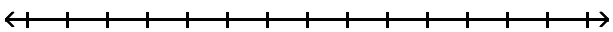


D) $(-7, \infty)$

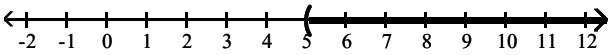


Answer: A

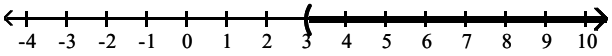
270) $5x + 1 \geq 4x + 4$



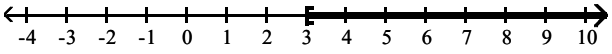
A) $(5, \infty)$



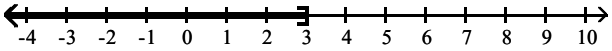
B) $(3, \infty)$



C) $[3, \infty)$

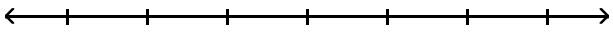


D) $(-\infty, 3]$

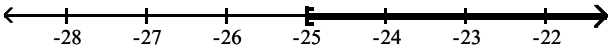


Answer: C

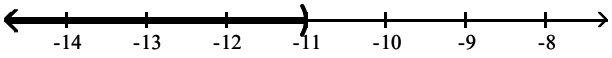
271) $9x - 7 > 8x - 18$



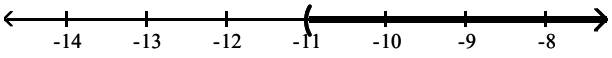
A) $[-25, \infty)$



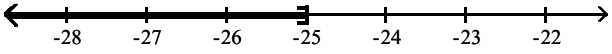
B) $(-\infty, -11)$



C) $(-11, \infty)$

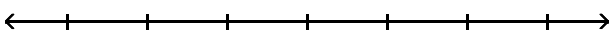


D) $(-\infty, -25]$

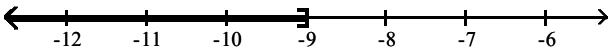


Answer: C

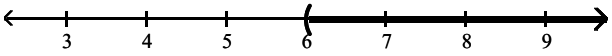
272) $6x + 6 \leq 5x - 3$



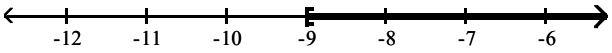
A) $(-\infty, -9]$



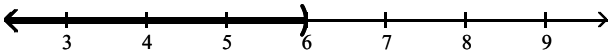
B) $(6, \infty)$



C) $[-9, \infty)$

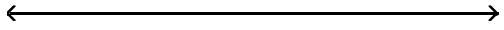


D) $(-\infty, 6)$

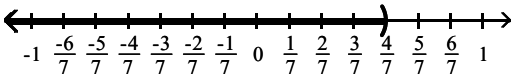


Answer: A

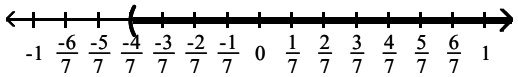
273) $x - \frac{4}{21} > -\frac{16}{21}$



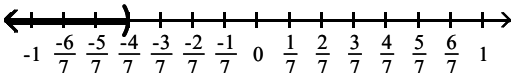
A) $\left(-\infty, \frac{4}{7}\right)$



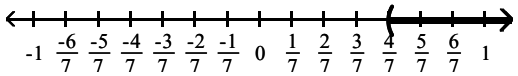
B) $\left(-\frac{4}{7}, \infty\right)$



C) $\left(-\infty, -\frac{4}{7}\right)$



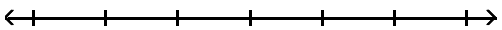
D) $\left(\frac{4}{7}, \infty\right)$



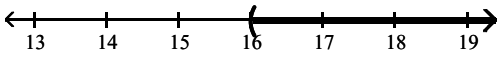
Answer: B

Use the multiplication property of inequality to solve the inequality and graph the solution set on a number line.

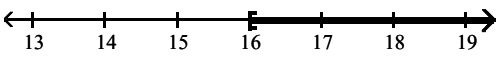
274) $\frac{x}{4} \geq 4$



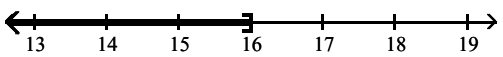
A) (16, ∞)



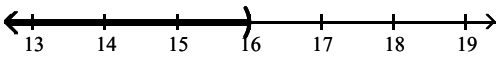
B) [16, ∞)



C) (-∞, 16]

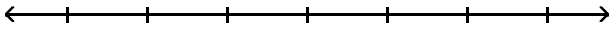


D) (-∞, 16)

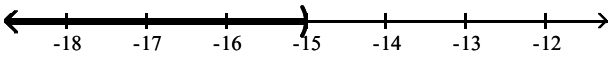


Answer: B

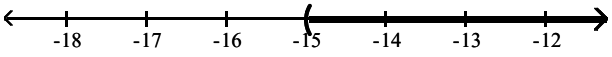
275) $\frac{x}{3} \leq -5$



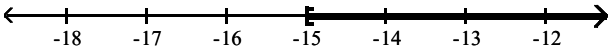
A) (-∞, –15)



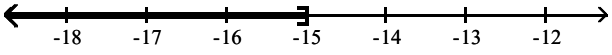
B) (–15, ∞)



C) [–15, ∞)

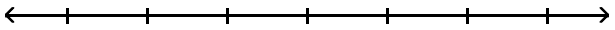


D) (-∞, –15]

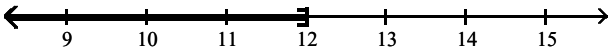


Answer: D

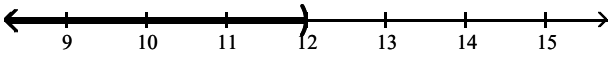
276) $\frac{y}{3} > 4$



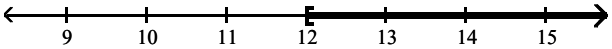
A) (-∞, 12]



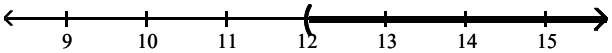
B) (-∞, 12)



C) [12, ∞)

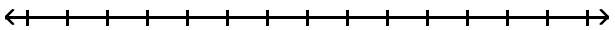


D) (12, ∞)

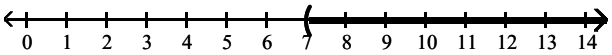


Answer: D

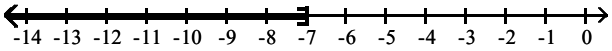
277) $7x \geq -49$



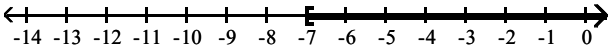
A) (7, ∞)



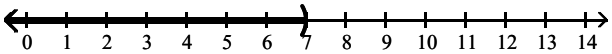
B) (−∞, −7]



C) [−7, ∞)

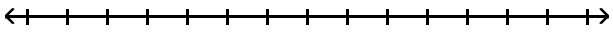


D) (−∞, 7)

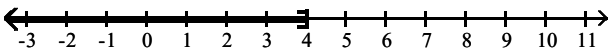


Answer: C

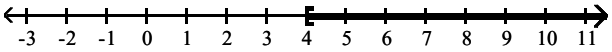
278) $8x < 32$



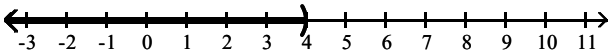
A) $(-\infty, 4]$



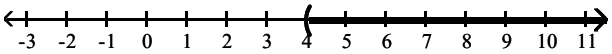
B) $[4, \infty)$



C) $(-\infty, 4)$

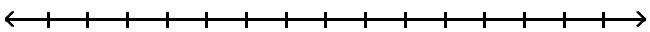


D) $(4, \infty)$

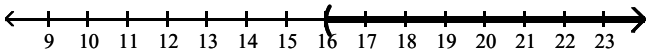


Answer: C

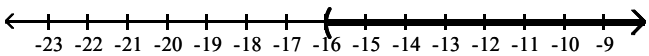
279) $-3x > 48$



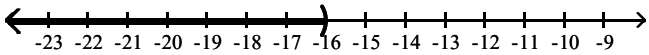
A) $(16, \infty)$



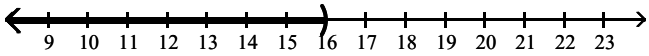
B) $(-16, \infty)$



C) $(-\infty, -16)$

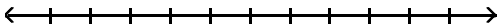


D) $(-\infty, 16)$

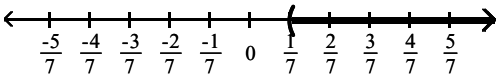


Answer: C

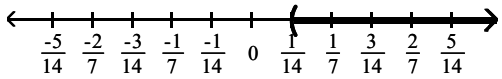
280) $-2x < -\frac{1}{7}$



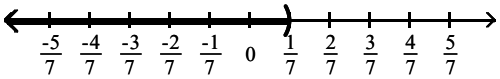
A) $\left(\frac{1}{7}, \infty\right)$



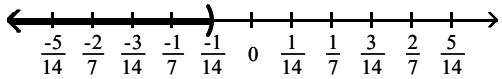
B) $\left(\frac{1}{14}, \infty\right)$



C) $\left(-\infty, \frac{1}{7}\right)$



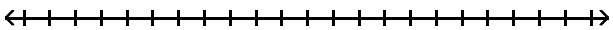
D) $\left(-\infty, -\frac{1}{14}\right)$



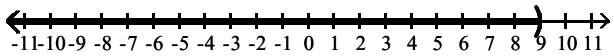
Answer: B

Use both the addition and multiplication properties of inequality to solve the inequality. Graph the solution set on a number line.

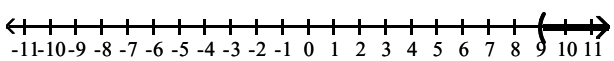
281) $4x + 1 < 37$



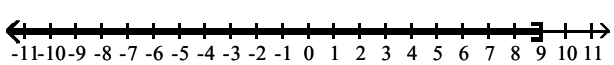
A) $(-\infty, 9)$



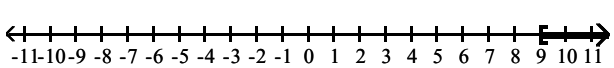
B) $(9, \infty)$



C) $(-\infty, 9]$

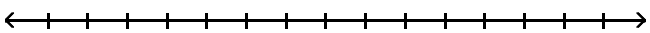


D) $[9, \infty)$

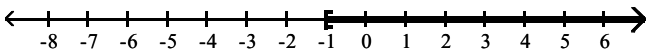


Answer: A

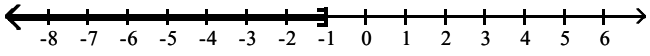
282) $2x - 4 \geq 2$



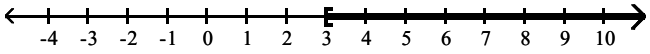
A) $[-1, \infty)$



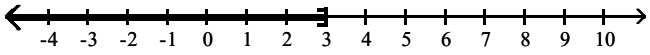
B) $(-\infty, -1]$



C) $[3, \infty)$

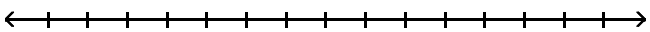


D) $(-\infty, 3]$

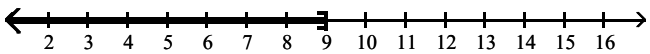


Answer: C

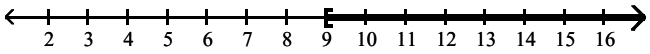
283) $8 - 2x \geq -10$



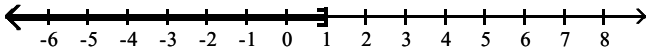
A) $(-\infty, 9]$



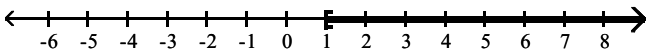
B) $[9, \infty)$



C) $(-\infty, 1]$

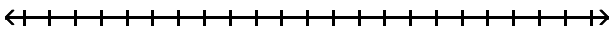


D) $[1, \infty)$

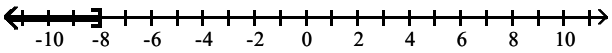


Answer: A

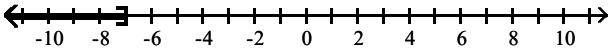
284) $11 - 3(3 - x) \leq -22$



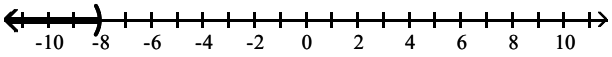
A) $(-\infty, -8]$



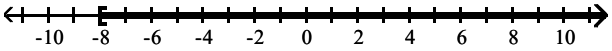
B) $(-\infty, -7]$



C) $(-\infty, -8)$

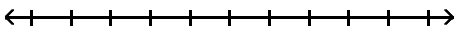


D) $[-8, \infty)$

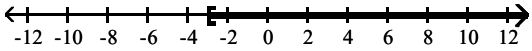


Answer: A

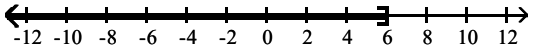
285) $8x - 10 \leq 2x - 13$



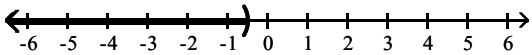
A) $[-3, \infty)$



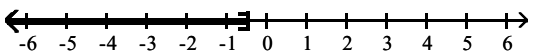
B) $(-\infty, 6]$



C) $\left(-\infty, -\frac{1}{2}\right)$

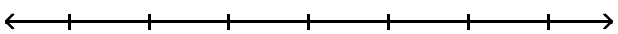


D) $\left(-\infty, -\frac{1}{2}\right]$

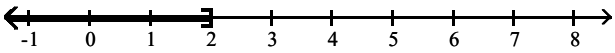


Answer: D

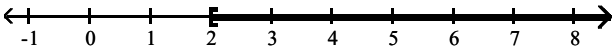
286) $5t + 7 \geq 3t + 3$



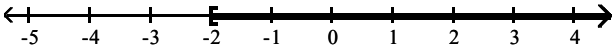
A) $(-\infty, 2]$



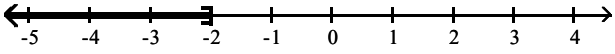
B) $[2, \infty)$



C) $[-2, \infty)$

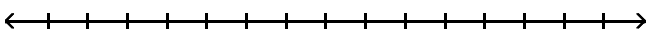


D) $(-\infty, -2]$

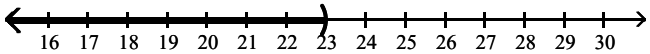


Answer: C

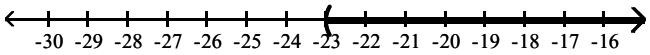
287) $5x - 5 < 6(x + 3)$



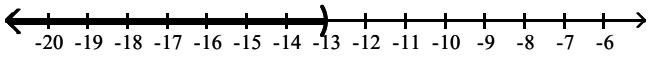
A) $(-\infty, 23)$



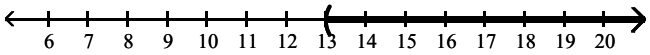
B) $(-23, \infty)$



C) $(-\infty, -13)$

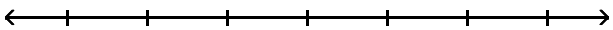


D) $(13, \infty)$

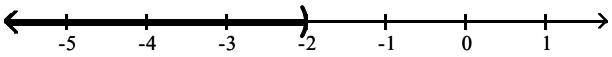


Answer: B

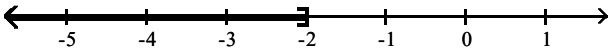
288) $20x + 40 > 5(3x + 6)$



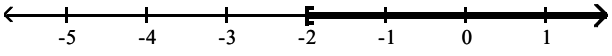
A) $(-\infty, -2)$



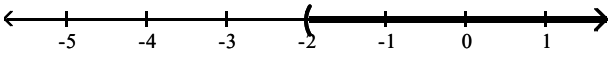
B) $(-\infty, -2]$



C) $[-2, \infty)$

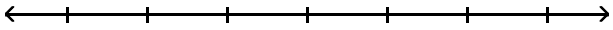


D) $(-2, \infty)$

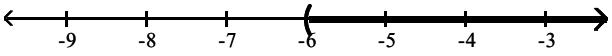


Answer: D

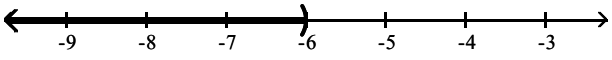
289) $-5(2x - 9) < -15x + 15$



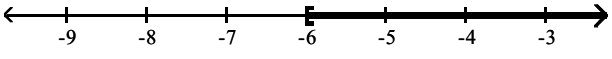
A) $(-6, \infty)$



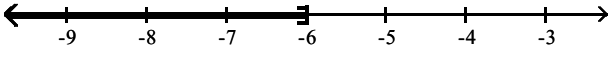
B) $(-\infty, -6)$



C) $[-6, \infty)$

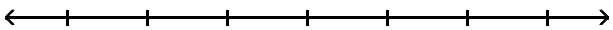


D) $(-\infty, -6]$

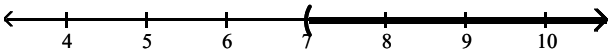


Answer: B

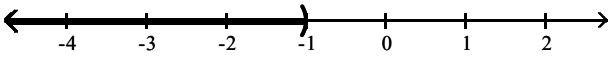
290) $-9x + 8 - 2x < 4 - 13x + 2$



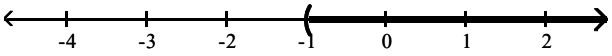
A) $(7, \infty)$



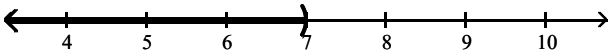
B) $(-\infty, -1)$



C) $(-1, \infty)$

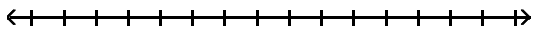


D) $(-\infty, 7)$

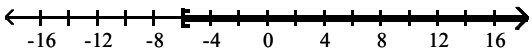


Answer: B

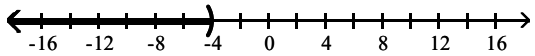
291) $\frac{x}{2} + 10 \leq 7$



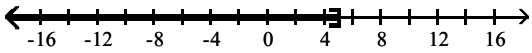
A) $[-6, \infty)$



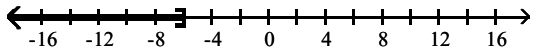
B) $(-\infty, -4)$



C) $(-\infty, 5]$

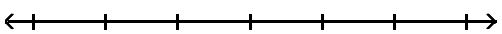


D) $(-\infty, -6]$

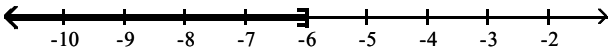


Answer: D

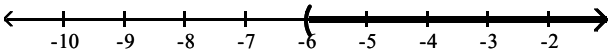
292) $25n - 35 \leq 5(4n - 13)$



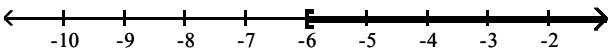
A) $(-\infty, -6]$



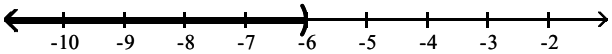
B) $(-6, \infty)$



C) $[-6, \infty)$

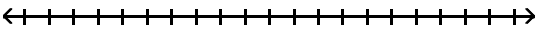


D) $(-\infty, -6)$

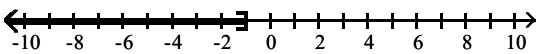


Answer: A

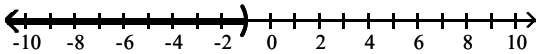
293) $\frac{2}{3}(2x - 1) < -2$



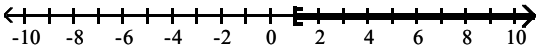
A) $(-\infty, -1]$



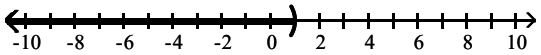
B) $(-\infty, -1)$



C) $[1, \infty)$



D) $(-\infty, 1)$



Answer: B

Solve the inequality.

294) $x + 8 \geq x - 4$

A) $[-6, \infty)$ B) $(-\infty, -6]$ C) $\varnothing$ D) $(-\infty, \infty)$

Answer: D

295) $9x + 5 > 9(x + 3)$

A) $(5, \infty)$ B) $(-\infty, 5)$ C) $(-\infty, \infty)$ D) $\varnothing$

Answer: D

296) $10x - 11 > 10(x - 9)$

A) $\varnothing$ B) $(-\infty, \infty)$ C) $(-\infty, 11)$ D) $(11, \infty)$

Answer: B

297) $3x \leq 3(x + 7)$

A) $\varnothing$ B) $(-\infty, 7]$ C) $(-\infty, 3]$ D) $(-\infty, \infty)$

Answer: D

298) $3x - 2 \geq 2(x - 1)$

A) $[0, \infty)$ B) $(-\infty, \infty)$ C) $(-\infty, 0]$ D) $\varnothing$

Answer: A

299) $-3(-3 - x) < 5x + 21 - 12 - 2x$

A) $(-\infty, 0)$ B) $(-\infty, 9)$ C) $\varnothing$ D) $(-\infty, \infty)$

Answer: C

Solve the problem.

300) Claire has received scores of 85, 88, 87, and 80 on her algebra tests. What is the minimum score she must receive on the fifth test to have an overall test score average of at least 82? (Hint: The average of a list of numbers is their sum divided by the number of numbers in the list.)

A) 70 B) 68 C) 71 D) 69

Answer: A

301) A certain car has a weight limit for all passengers and cargo of 1107 pounds. The four passengers in the car weigh an average of 165 pounds. Use an inequality to find the maximum weight of the cargo that the car can handle.

A) at most 447 lb B) at most 942 lb C) at most $\frac{1107}{2}$ lb D) at most $\frac{369}{55}$ lb

Answer: A

302) A certain store has a fax machine available for use by its customers. The store charges \$2.05 to send the first page and \$0.60 for each subsequent page. Use an inequality to find the maximum number of pages that can be faxed for \$6.85

A) at most 49 pages B) at most 3 pages C) at most 8 pages D) at most 11 pages

Answer: C

303) An archery set containing a bow and three arrows costs \$74. Additional arrows can be purchased for \$9 each. Gerri has \$128 to spend on the set and additional arrows. Including the arrows in the set, what is the maximum total number of arrows Gerri can purchase?

A) at most 9 arrows B) at most 1 arrow(s) C) at most 6 arrows D) at most 14 arrows

Answer: A

304) When making a long distance call from a certain pay phone, the first three minutes of a call cost \$2.95. After that, each additional minute or portion of a minute of that call costs \$0.45. Use an inequality to find the maximum number of minutes one can call long distance for \$7.00.

A) at most 12 min B) at most 9 min C) at most 16 min D) at most 2 min

Answer: A

305) It takes 24 minutes to set up a candy making machine. Once the machine is set up, it produces 30 candies per minute. Use an inequality to find the number of candies that can be produced in 4 hours if the machine has not yet been set up.

A) at most 5040 candies B) at most 6480 candies

C) at most 120 candies D) at most 2880 candies

Answer: B

Solve the equation.

306) $-4x - 7 = 9$

A) {4} B) {20} C) {24} D) {–4}

Answer: D

307) $5x + 6 = 3x - 3$

A) $\left\{\frac{2}{9}\right\}$ B) $\left\{-\frac{9}{2}\right\}$ C) $\left\{\frac{8}{3}\right\}$ D) $\left\{-\frac{2}{9}\right\}$

Answer: B

308) $9x + 2(-2x - 6) = 2 - 9x$

A) {1} B) {– 1} C) $\left\{\frac{5}{2}\right\}$ D) $\left\{-\frac{5}{7}\right\}$

Answer: A

309) $4(2y - 3) = 7(y + 2)$

A) {–2} B) {26} C) {2} D) {6}

Answer: B

310) $-\frac{1}{3}x = -9$

A) {27} B) {–13} C) {–12} D) {3}

Answer: A

311) $\frac{x}{5} + \frac{6}{5} = \frac{x}{7} + \frac{8}{7}$

A) {1} B) {2} C) {–1} D) {–2}

Answer: C

312) $1.3 - 6x = -27.4 - 1.9x$

A) {4.8} B) {7} C) {5.1} D) {–33}

Answer: B

Solve the problem.

313) In one state, speeding fines are determined by the formula $F = 8(x - 60) + 75$, where F is the cost, in dollars, of the fine if a person is caught driving x miles per hour. If the fine comes to $275, how fast was the person driving?

A) 87 mph B) 85 mph C) 83 mph D) 95 mph

Answer: B

Solve the formula for the specified variable.

314) $V = lwh$ for h

A) $h = Vlw$ B) $h = \frac{lw}{V}$ C) $h = \frac{V}{lw}$ D) $h = \frac{Vl}{w}$

Answer: C

315) $w = \frac{P - 2l}{2}$ for l

A) $l = 2P - 4w$ B) $l = \frac{P + 2w}{2}$ C) $l = \frac{P - 2w}{2}$ D) $l = \frac{2}{P - 2w}$

Answer: C

Solve the problem.

316) What is 6% of 10?

A) 6 B) 60 C) 0.06 D) 0.6

Answer: D

317) 15.5 is 155% of what?

A) 0.1 B) 10 C) 24.025 D) 2402.5

Answer: B

318) 1.4 is what percent of 4 ?

A) 0.35% B) 35% C) 5.6% D) 560%

Answer: B

319) Four times a number added to 9 times the number is 65. What is the number?

A) 7.2 B) 0.6 C) 5 D) –7.2

Answer: C

320) 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 $290,000, find each worker's salary.

A) president's salary = $72,500; department head's salary = $217,500
B) president's salary = $145,000; department head's salary = $72,500
C) president's salary = $217,500; department head's salary = $72,500
D) president's salary = $21,750; department head's salary = $7250

Answer: C

321) A promotional deal for long distance phone service charges a $15 basic fee plus $0.05 per minute for all calls. If Joe's phone bill was $47 under this promotional deal, how many minutes of phone calls did he make? Round to the nearest integer, if necessary.

A) 1240 min B) 640 min C) 2 min D) 6 min

Answer: B

322) A rectangular carpet has a perimeter of 180 inches. The length of the carpet is 42 inches more than the width. What are the dimensions of the carpet?

A) length: 90 in.; width: 78 in.
B) length: 81 in.; width: 57 in.
C) length: 66 in.; width: 24 in.
D) length: 90 in.; width: 66 in.

Answer: C

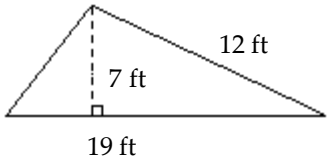
323) Sales at a local ice cream shop went up 30% in 5 years. If 18,000 ice cream cones were sold in the current year, find the number of ice cream cones sold 5 years ago. Round to the nearest cone when necessary.

A) 5400 ice cream cones
B) 13,846 ice cream cones
C) 60,000 ice cream cones
D) 12,600 ice cream cones

Answer: B

Find the area of the figure.

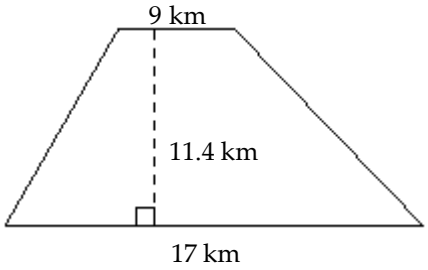
324)



A) 133 ft^2 B) 114 ft^2 C) 66.5 ft^2 D) 42 ft^2

Answer: C

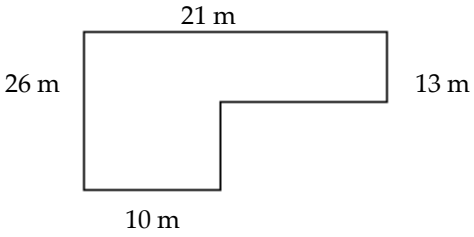
325)



A) 193.8 km^2 B) 296.4 km^2 C) 102.6 km^2 D) 148.2 km^2

Answer: D

326)

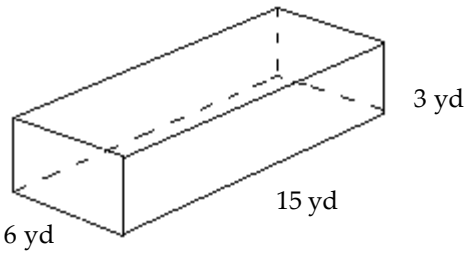


A) 403 m^2 B) 377 m^2 C) 416 m^2 D) 507 m^2

Answer: A

Find the volume of the figure. Where applicable, express answers in terms of π.

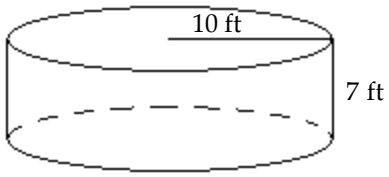
327)



A) 270 yd^3 B) 135 yd^3 C) 1350 yd^3 D) 108 yd^3

Answer: A

328)



A) 700 ft^3 B) 70π ft^3 C) 700π ft^3 D) 100π ft^3

Answer: C

Solve the problem.

329) What will it cost to cover a rectangular floor measuring 90 feet by 50 feet with square tiles that measure 3 feet on each side if a box of 10 tiles costs $18 per box?

A) $450 B) $900 C) $2700 D) $38

Answer: B

330) A sailboat has a triangular sail with an area of 42 square feet and a base that measures 6 feet. Find the height of the sail.

A) 28 ft B) 14 ft C) 21 ft D) 7 ft

Answer: B

331) In a triangle, one angle is 2 times as large as another. The measure of the third angle is 140° greater than that of the smallest angle. Find the measure of each angle.

A) 15°, 30°, 135° B) 10°, 20°, 150° C) 20°, 40°, 120° D) 10°, 20°, 140°

Answer: B

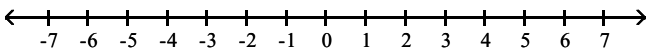
332) How many degrees are there in an angle that measures 8° more than the measure of its compliment?

A) 41° B) 94° C) 49° D) 86°

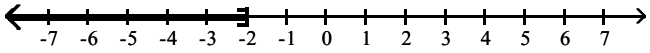
Answer: C

Express the solution set of the inequality in interval notation and graph the interval.

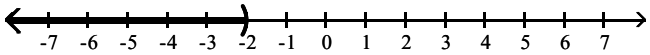
333) $x > -2$



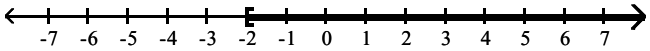
A) $(-\infty, -2]$



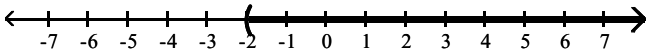
B) $(-\infty, -2)$



C) $[-2, \infty)$

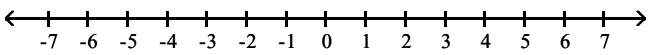


D) $(-2, \infty)$

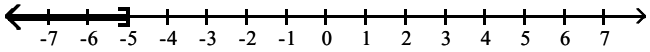


Answer: D

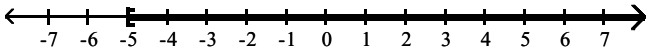
334) $x \leq -5$



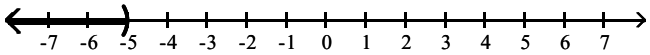
A) $(-\infty, -5]$



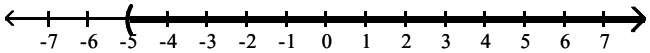
B) $[-5, \infty)$



C) $(-\infty, -5)$



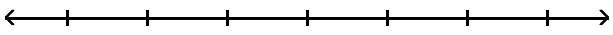
D) $(-5, \infty)$



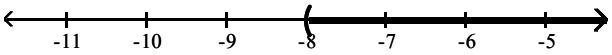
Answer: A

Solve the inequality and graph the solution set on a number line.

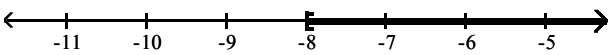
335) $\frac{y}{4} \leq -2$



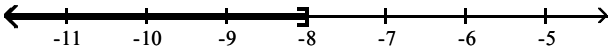
A) $(-8, \infty)$



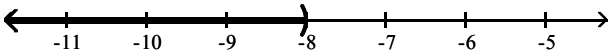
B) $[-8, \infty)$



C) $(-\infty, -8]$

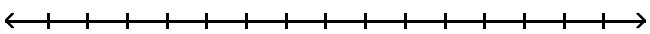


D) $(-\infty, -8)$

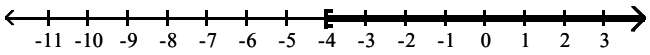


Answer: C

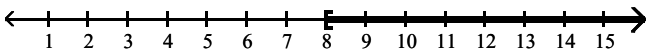
336) $24 - 4x \geq -8$



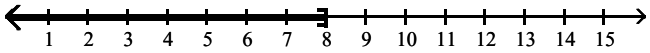
A) $[-4, \infty)$



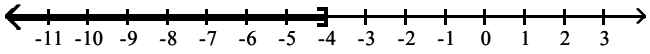
B) $[8, \infty)$



C) $(-\infty, 8]$

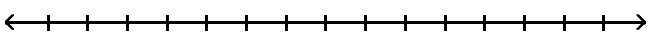


D) $(-\infty, -4]$

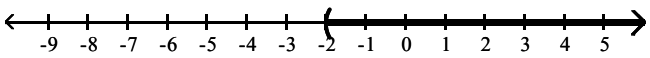


Answer: C

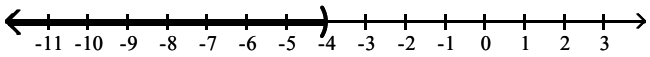
337) $2x + 1 < 3(x - 1)$



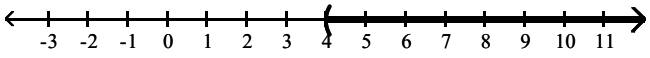
A) $(-2, \infty)$



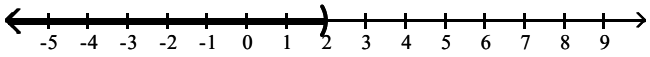
B) $(-\infty, -4)$



C) $(4, \infty)$



D) $(-\infty, 2)$



Answer: C

Solve the problem.

338) Claire received scores of 85, 88, 87, and 80 on her algebra tests. What score must she receive on the fifth test to have an overall test score average of at least 82?

A) at least 70 B) at most 70 C) at least 71 D) at most 71

Answer: A

339) The length of a rectangle is 26 feet. For what widths is the perimeter less than 68 feet?

A) widths less than 16 ft B) widths less than 8 ft
C) widths less than 21 ft D) widths less than 42 ft

Answer: B