Sullivan *Algebra & Trigonometry* 12e
Chapter 1 Test

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

Solve the equation.

1) $3x = -18$

A) {6} B) {-3} C) {3} D) {-6}

Objective: (1.1) Solve a Linear Equation

2) $10x = 16$

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

Objective: (1.1) Solve a Linear Equation

3) $3x + 12 = 0$

A) {-4} B) {4} C) {-3} D) {3}

Objective: (1.1) Solve a Linear Equation

4) $6x - 17 = 0$

A) $\left\{-\frac{6}{17}\right\}$ B) $\left\{\frac{17}{6}\right\}$ C) $\left\{-\frac{17}{6}\right\}$ D) $\left\{\frac{6}{17}\right\}$

Objective: (1.1) Solve a Linear Equation

5) $4x + 14 = 0$

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

Objective: (1.1) Solve a Linear Equation

6) $\frac{2}{7}x = -\frac{3}{4}$

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

Objective: (1.1) Solve a Linear Equation

7) $11x = -15 + 10x$

A) {-14} B) {15} C) {-15} D) {-5}

Objective: (1.1) Solve a Linear Equation

8) $13x - 8 = 5x - 72$

A) {9} B) {8} C) {-9} D) {-8}

Objective: (1.1) Solve a Linear Equation

9) $-8x + 14 = -6x - 4$

A) {-9} B) {-7} C) {9} D) {7}

Objective: (1.1) Solve a Linear Equation

10) $12 - 5x = 2 - 3x$

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

Objective: (1.1) Solve a Linear Equation

11) $6x - (5x - 1) = 2$

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

Objective: (1.1) Solve a Linear Equation

12) $3(2x - 1) = 12$

A) $\left\{\frac{11}{6}\right\}$ B) $\left\{\frac{5}{2}\right\}$ C) $\left\{\frac{3}{2}\right\}$ D) $\left\{\frac{13}{6}\right\}$

Objective: (1.1) Solve a Linear Equation

13) $12(3x - 2) = 2x - 9$

A) $\left\{-\frac{15}{34}\right\}$ B) $\left\{\frac{15}{38}\right\}$ C) $\left\{\frac{15}{34}\right\}$ D) $\left\{\frac{33}{34}\right\}$

Objective: (1.1) Solve a Linear Equation

14) $6(x + 5) = 7[x - (3 - x)]$

A) $\left\{\frac{15}{4}\right\}$ B) $\left\{-\frac{15}{4}\right\}$ C) $\left\{\frac{51}{8}\right\}$ D) $\left\{-\frac{51}{8}\right\}$

Objective: (1.1) Solve a Linear Equation

15) $5(x + 4) = 6(x - 7)$

A) $\{62\}$ B) $\{-62\}$ C) $\{6\}$ D) $\{-22\}$

Objective: (1.1) Solve a Linear Equation

16) $5(2x - 2) = 9(x + 4)$

A) $\{31\}$ B) $\{-46\}$ C) $\{-26\}$ D) $\{46\}$

Objective: (1.1) Solve a Linear Equation

17) $5(x + 3) = (5x + 15)$

A) no solution B) $\{0\}$ C) $\{30\}$ D) all real numbers

Objective: (1.1) Solve a Linear Equation

18) $-7x + 5 + 6(x + 1) = 2x - 3$

A) $\left\{\frac{14}{3}\right\}$ B) $\{2\}$ C) $\left\{\frac{1}{8}\right\}$ D) $\left\{-\frac{2}{5}\right\}$

Objective: (1.1) Solve a Linear Equation

19) $-7x + 2 + 5x = -2x + 7$

A) $\{-2\}$ B) $\{5\}$ C) no solution D) all real numbers

Objective: (1.1) Solve a Linear Equation

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

A) {36} B) {-24} C) {24} D) {-36}

Objective: (1.1) Solve a Linear Equation

21) $\frac{x}{2} - \frac{1}{2} = -5$

A) {9} B) {11} C) {-11} D) {-9}

Objective: (1.1) Solve a Linear Equation

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

A) {-90} B) {-45} C) {45} D) {90}

Objective: (1.1) Solve a Linear Equation

23) $\frac{x}{3} - 4 = \frac{x}{2} - 2$

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

Objective: (1.1) Solve a Linear Equation

24) $\frac{1}{3} + \frac{x}{4} = \frac{11}{12}$

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

Objective: (1.1) Solve a Linear Equation

25) $-7.4x + 1.8 = -15.9 - 1.5x$

A) {3} B) {2.6} C) {2.4} D) {-24}

Objective: (1.1) Solve a Linear Equation

26) $\frac{-2x + 9}{2} + 2 = -\frac{4x}{3}$

A) $\left\{-\frac{39}{2}\right\}$ B) $\left\{-\frac{15}{2}\right\}$ C) $\left\{\frac{39}{14}\right\}$ D) $\left\{\frac{15}{2}\right\}$

Objective: (1.1) Solve a Linear Equation

27) $1 - \frac{5}{8x} = \frac{8}{7}$

A) $\left\{-\frac{35}{8}\right\}$ B) $\{-5\}$ C) $\{-7\}$ D) $\left\{\frac{35}{8}\right\}$

Objective: (1.1) Solve Equations That Lead to Linear Equations

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

A) {5} B) {2} C) {-5} D) {-2}

Objective: (1.1) Solve Equations That Lead to Linear Equations

29) $(x + 9)(x - 1) = (x + 1)^2$

A) {10} B) $\left\{\frac{5}{3}\right\}$ C) $\left\{\frac{3}{2}\right\}$ D) $\left\{\frac{10}{9}\right\}$

Objective: (1.1) Solve Equations That Lead to Linear Equations

30) $x(4x - 1) = (4x + 1)(x - 5)$

A) $\left\{-\frac{5}{19}\right\}$ B) $\left\{-\frac{5}{18}\right\}$ C) $\left\{-\frac{5}{3}\right\}$ D) {2}

Objective: (1.1) Solve Equations That Lead to Linear Equations

31) $x(1 + 3x) = (3x - 1)(x - 3)$

A) $\left\{-\frac{3}{11}\right\}$ B) $\left\{\frac{3}{121}\right\}$ C) $\left\{-\frac{3}{121}\right\}$ D) $\left\{\frac{3}{11}\right\}$

Objective: (1.1) Solve Equations That Lead to Linear Equations

32) $x(x^2 + 2) = 6 + x^3$

A) {6} B) {2} C) $\left\{\frac{1}{3}\right\}$ D) {3}

Objective: (1.1) Solve Equations That Lead to Linear Equations

33) $\frac{3}{x + 5} + \frac{2}{2x + 1} = \frac{4}{x - 2}$

A) $\left\{-\frac{47}{46}\right\}$ B) $\left\{\frac{46}{47}\right\}$ C) $\left\{-\frac{46}{47}\right\}$ D) $\left\{\frac{47}{46}\right\}$

Objective: (1.1) Solve Equations That Lead to Linear Equations

34) $\frac{2x}{x^2 - 16} = \frac{3}{x^2 - 16} - \frac{1}{x + 4}$

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

Objective: (1.1) Solve Equations That Lead to Linear Equations

35) $\frac{5 - x}{x} + \frac{3}{4} = \frac{7}{x}$

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

Objective: (1.1) Solve Equations That Lead to Linear Equations

36) $\frac{1}{x} + \frac{1}{x + 4} = \frac{x + 5}{x + 4}$

A) {1} B) {4} C) {-4} D) {-1}

Objective: (1.1) Solve Equations That Lead to Linear Equations

37) $\frac{6}{2x - 3} = \frac{4}{2x + 5}$

A) $\left\{-\frac{2}{21}\right\}$ B) $\left\{\frac{2}{21}\right\}$ C) $\left\{\frac{21}{2}\right\}$ D) $\left\{-\frac{21}{2}\right\}$

Objective: (1.1) Solve Equations That Lead to Linear Equations

38) $\frac{x - 2}{x - 5} = \frac{x + 6}{x - 7}$

A) $\left\{\frac{8}{5}\right\}$ B) $\left\{\frac{22}{5}\right\}$ C) $\left\{-\frac{15}{7}\right\}$ D) {-4}

Objective: (1.1) Solve Equations That Lead to Linear Equations

39) $\frac{8x - 6}{2x - 7} = \frac{20x + 6}{5x - 1}$

A) $\left\{\frac{18}{83}\right\}$ B) $\left\{\frac{24}{83}\right\}$ C) $\left\{-\frac{8}{15}\right\}$ D) $\left\{-\frac{2}{5}\right\}$

Objective: (1.1) Solve Equations That Lead to Linear Equations

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

A) $\left\{-\frac{5}{6}\right\}$ B) $\left\{-\frac{5}{2}\right\}$ C) {-5} D) no solution

Objective: (1.1) Solve Equations That Lead to Linear Equations

41) $\frac{3}{x + 2} - \frac{7}{x - 2} = \frac{4}{x^2 - 4}$

A) {24} B) {-6} C) $\{\sqrt{21}\}$ D) {6}

Objective: (1.1) Solve Equations That Lead to Linear Equations

42) $\frac{6x - 4}{2x - 9} = \frac{9x - 3}{3x + 1}$

A) $\left\{-\frac{1}{3}\right\}$ B) $\left\{\frac{23}{81}\right\}$ C) $\left\{-\frac{23}{93}\right\}$ D) $\left\{\frac{31}{81}\right\}$

Objective: (1.1) Solve Equations That Lead to Linear Equations

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

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

Objective: (1.1) Solve Equations That Lead to Linear Equations

Solve the equation. The letters a, b, and c are constants.

44) $ax - b = c, a \neq 0$

A) $x = \frac{b + c}{a}$ B) $x = \frac{c - b}{a}$ C) $x = -\frac{b + c}{a}$ D) $x = \frac{b - c}{a}$

Objective: (1.1) Solve Problems That Can Be Modeled by Linear Equations

45) $\frac{x}{a} + \frac{x}{b} = c, a \neq 0, b \neq 0, a \neq -b$

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

Objective: (1.1) Solve Problems That Can Be Modeled by Linear Equations

46) $\frac{a}{x} + \frac{b}{x} = c, c \neq 0$

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

Objective: (1.1) Solve Problems That Can Be Modeled by Linear Equations

Solve the formula for the indicated variable.

47) $PV = nRT$ for T

A) $T = \frac{PV}{R}$ B) $T = \frac{PV}{nR}$ C) $T = \frac{PVR}{n}$ D) $T = \frac{nPV}{R}$

Objective: (1.1) Solve Problems That Can Be Modeled by Linear Equations

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

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

Objective: (1.1) Solve Problems That Can Be Modeled by Linear Equations

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

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

Objective: (1.1) Solve Problems That Can Be Modeled by Linear Equations

50) $A = P(1 + rt)$ for r

A) $r = \frac{P - A}{tP}$ B) $r = \frac{A - P}{tP}$ C) $r = \frac{A + P}{tP}$ D) $r = -\frac{A + P}{tP}$

Objective: (1.1) Solve Problems That Can Be Modeled by Linear Equations

51) $P - \frac{7Q}{3} = \frac{P + 5}{2} + 1$ for P

A) $P = \frac{21 + 14Q}{3}$ B) $P = \frac{9 + 14Q}{3}$ C) $P = \frac{21 - 14Q}{3}$ D) $P = \frac{9 - 14Q}{3}$

Objective: (1.1) Solve Problems That Can Be Modeled by Linear Equations

Solve the problem.

52) Mary and her brother John collect foreign coins. Mary has twice the number of coins that John has. Together they have 120 foreign coins. Find how many coins Mary has.

A) 16 coins B) 40 coins C) 72 coins D) 80 coins

Objective: (1.1) Solve Problems That Can Be Modeled by Linear Equations

53) Center City East Parking Garage has a capacity of 253 cars more than Center City West Parking Garage. If the combined capacity for the two garages is 1,215 cars, find the capacity for each garage.

A) Center City East: 744 cars
Center City West: 471 cars

B) Center City East: 481 cars
Center City West: 734 cars

C) Center City East: 471 cars
Center City West: 744 cars

D) Center City East: 734 cars
Center City West: 481 cars

Objective: (1.1) Solve Problems That Can Be Modeled by Linear Equations

54) During an intramural basketball game, Team A scored 17 fewer points than Team B. Together, both teams scored a total of 151 points. How many points did Team A score during the game?

A) 75 points B) 67 points C) 84 points D) 68 points

Objective: (1.1) Solve Problems That Can Be Modeled by Linear Equations

55) An auto repair shop charged a customer $384 to repair a car. The bill listed $54 for parts and the remainder for labor. If the cost of labor is $55 per hour, how many hours of labor did it take to repair the car?

A) 7 hr B) 6 hr C) 5 hr D) 6.5 hr

Objective: (1.1) Solve Problems That Can Be Modeled by Linear Equations

56) Going into the final exam, which will count as three tests, Jerome has test scores of 61, 72, 59, 75, and 77. What score does Jerome need on the final in order to earn a C, which requires an average of 70?

A) 70 B) 75 C) 79 D) 72

Objective: (1.1) Solve Problems That Can Be Modeled by Linear Equations

57) After a 16% price reduction, a boat sold for $26,880. What was the boat's price before the reduction? (Round to the nearest cent, if necessary.)

A) $32,000 B) $31,180.80 C) $168,000.00 D) $4,300.80

Objective: (1.1) Solve Problems That Can Be Modeled by Linear Equations

58) Inclusive of a 6.8% sales tax, a diamond ring sold for $2,029.20. Find the price of the ring before the tax was added. (Round to the nearest cent, if necessary.)

A) $2,167.19 B) $137.99 C) $1,900 D) $1,891.21

Objective: (1.1) Solve Problems That Can Be Modeled by Linear Equations

59) It costs $27 per hour plus a flat fee of $20 for a plumber to make a house call. After writing an equation for this situation, suppose the total cost to have a plumber come to a house is $290. How many hours did the plumber work?

A) 6 hr B) 21 hr C) 10 hr D) 17 hr

Objective: (1.1) Solve Problems That Can Be Modeled by Linear Equations

60) A rectangular carpet has a perimeter of 240 inches. The length of the carpet is 72 inches more than the width. What are the dimensions of the carpet?

A) 96 in. by 24 in. B) 96 in. by 120 in. C) 108 in. by 120 in. D) 72 in. by 96 in.

Objective: (1.1) Solve Problems That Can Be Modeled by Linear Equations

61) The perimeter of a triangle is 65 centimeters. Find the lengths of its sides, if the longest side is 7 centimeters longer than the shorter side, and the remaining side is 4 centimeters longer than the shorter side.

A) 17 cm, 20 cm, 28 cm

B) 18 cm, 22 cm, 25 cm

C) 20 cm, 22 cm, 23 cm

D) 16 cm, 20 cm, 29 cm

Objective: (1.1) Solve Problems That Can Be Modeled by Linear Equations

62) x represents the number of textbooks purchased at $25 per book, and y represents the total amount of money spent on textbooks. What is an equation of the form y = ax for this situation?

A) y = 13x B) y = 25x C) y = 75x D) y = 50x

Objective: (1.1) Solve Problems That Can Be Modeled by Linear Equations

63) It costs $42 per hour plus a flat fee of $33 for a plumber to make a house call. What is an equation of the form y = ax + b for this situation?

A) y = 42x B) y = 33x C) y = 42x + 33 D) y = 33x + 42

Objective: (1.1) Solve Problems That Can Be Modeled by Linear Equations

64) Using a phone card to make a long distance call costs a flat fee of $0.67 plus $0.25 per minute starting with the first minute. What is an equation of the form y = ax + b for this situation?

A) y = 0.67x B) y = 0.25x + 0.67 C) y = 0.25x D) y = 0.67x + 0.25

Objective: (1.1) Solve Problems That Can Be Modeled by Linear Equations

65) x represents the number of textbooks purchased at $58 per book, and y represents the total amount of money spent on textbooks. After writing an equation for this situation, what is the cost of 4 textbooks?

A) $116.00 B) $232 C) $464 D) $14.50

Objective: (1.1) Solve Problems That Can Be Modeled by Linear Equations

66) x represents the number of cassette tapes sold at $8.75 per tape, and y represents the total cost of the cassette tapes. After writing an equation for this situation, what is the total cost of 14 cassettes?

A) $61.25 B) $245 C) $0.62 D) $122.5

Objective: (1.1) Solve Problems That Can Be Modeled by Linear Equations

67) It costs $27 per hour plus a flat fee of $19 for a plumber to make a house call. After writing an equation for this situation, what is the total cost to have a plumber come to a house for 4 hours?

A) $108 B) $127 C) $517 D) $103

Objective: (1.1) Solve Problems That Can Be Modeled by Linear Equations

Solve the equation by factoring.

68) $2x^2 - 11x = 0$

A) $\{\frac{11}{2}, -\frac{11}{2}\}$ B) $\{-\frac{11}{2}, 0\}$ C) $\{0\}$ D) $\{\frac{11}{2}, 0\}$

Objective: (1.2) Solve a Quadratic Equation by Factoring

69) $54x^2 + 30x = 0$

A) $\{\frac{5}{9}, -\frac{5}{9}\}$ B) $\{-\frac{5}{9}, 0\}$ C) $\{\frac{5}{9}, 0\}$ D) $\{0\}$

Objective: (1.2) Solve a Quadratic Equation by Factoring

70) $x^2 - 100 = 0$

A) {-10} B) {100} C) {10, -10} D) {10}

Objective: (1.2) Solve a Quadratic Equation by Factoring

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

71) $x^2 - x = 72$

Objective: (1.2) Solve a Quadratic Equation by Factoring

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

72) $x^2 - 7x + 12 = 0$

A) {4, -3} B) {-4, -3} C) {4, 3} D) {-4, 3}

Objective: (1.2) Solve a Quadratic Equation by Factoring

73) $x^2 - 4x - 12 = 0$

A) {2, -6} B) {-2, 6} C) {-2, -6} D) {2, 6}

Objective: (1.2) Solve a Quadratic Equation by Factoring

74) $3x^2 + 12x - 15 = 0$

A) {- 1, 5} B) {1, 5} C) {1, - 5} D) {- 1, - 5}

Objective: (1.2) Solve a Quadratic Equation by Factoring

75) $3x^2 - 9 = 0$

A) {-3, 3} B) {4} C) $\{-\sqrt{3}, \sqrt{3}\}$ D) {4.5}

Objective: (1.2) Solve a Quadratic Equation by Factoring

76) $x(x - 11) + 30 = 0$

A) {-6, 5} B) {6, -5} C) {6, 5} D) {-6, -5}

Objective: (1.2) Solve a Quadratic Equation by Factoring

77) $49x^2 - 84x + 36 = 0$

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

Objective: (1.2) Solve a Quadratic Equation by Factoring

78) $12x^2 - 5x - 25 = 0$

A) $\{-\frac{5}{4}, \frac{5}{3}\}$ B) $\{\frac{5}{4}, -\frac{5}{3}\}$ C) $\{-\frac{5}{4}, -\frac{5}{3}\}$ D) $\{\frac{5}{4}, \frac{5}{3}\}$

Objective: (1.2) Solve a Quadratic Equation by Factoring

79) $9x - 71 = \frac{8}{x}$

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

Objective: (1.2) Solve a Quadratic Equation by Factoring

80) $15x + \frac{18}{x} = -39$

A) $\{2, \frac{3}{5}\}$ B) $\{-\frac{1}{2}, \frac{3}{5}\}$ C) $\{15, \frac{5}{3}\}$ D) $\{-2, -\frac{3}{5}\}$

Objective: (1.2) Solve a Quadratic Equation by Factoring

81) $\frac{x - 4}{x} = \frac{15}{x + 4}$

A) {4, 1} B) {16, -1} C) {16, 1} D) {4, -1}

Objective: (1.2) Solve a Quadratic Equation by Factoring

Solve the equation by the Square Root Method.

82) $x^2 = 25$

A) {5, -5} B) {5} C) {12.5} D) {6, -6}

Objective: (1.2) Solve a Quadratic Equation by Factoring

83) $(x - 3)^2 = 9$

A) {0, -6} B) {3, -3} C) {6, 0} D) {12}

Objective: (1.2) Solve a Quadratic Equation by Factoring

84) $(2x - 5)^2 = 25$

A) {10, 0} B) {0, -10} C) {0, -5} D) {5, 0}

Objective: (1.2) Solve a Quadratic Equation by Factoring

85) $x^2 = 7$

A) {7, -7} B) $\{\sqrt{7}, -\sqrt{7}\}$ C) $\{\sqrt{7}\}$ D) no real solution

Objective: (1.2) Solve a Quadratic Equation by Factoring

86) $(x + 4)^2 = 11$

A) $\{\sqrt{11}, -\sqrt{11}\}$ B) $\{4 + \sqrt{11}, 4 - \sqrt{11}\}$

C) {7} D) $\{-4 + \sqrt{11}, -4 - \sqrt{11}\}$

Objective: (1.2) Solve a Quadratic Equation by Factoring

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the equation by completing the square.

87) $x^2 - 4x + 1 = 0$

Objective: (1.2) Solve a Quadratic Equation by Completing the Square

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

88) $x^2 + 4x = 7$

A) $\{-1 - \sqrt{11}, -1 + \sqrt{11}\}$ B) $\{2 + \sqrt{11}\}$

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

Objective: (1.2) Solve a Quadratic Equation by Completing the Square

89) $x^2 + 4x - 45 = 0$

A) $\{\sqrt{7}, -1\}$ B) $\{-36, -9\}$ C) $\{5, -9\}$ D) $\{-5, 9\}$

Objective: (1.2) Solve a Quadratic Equation by Completing the Square

90) $x^2 + 16x + 43 = 0$

A) $\{8 + \sqrt{21}\}$

B) $\{-16 + \sqrt{43}\}$

C) $\{8 - \sqrt{43}, 8 + \sqrt{43}\}$

D) $\{-8 - \sqrt{21}, -8 + \sqrt{21}\}$

Objective: (1.2) Solve a Quadratic Equation by Completing the Square

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

A) $\{\frac{-5 - 3\sqrt{5}}{2}, \frac{-5 + 3\sqrt{5}}{2}\}$

B) $\{-5 - 3\sqrt{5}, -5 + 3\sqrt{5}\}$

C) $\{\frac{5 + 3\sqrt{5}}{2}\}$

D) $\{\frac{-5 - 3\sqrt{5}}{2}\}$

Objective: (1.2) Solve a Quadratic Equation by Completing the Square

92) $x^2 + 8x - 5 = 0$

A) $\{-4 - 2\sqrt{21}, -4 + 2\sqrt{21}\}$

B) $\{-1 - \sqrt{21}, -1 + \sqrt{21}\}$

C) $\{4 + \sqrt{21}\}$

D) $\{-4 - \sqrt{21}, -4 + \sqrt{21}\}$

Objective: (1.2) Solve a Quadratic Equation by Completing the Square

93) $x^2 - 8x - 13 = 0$

A) $\{4 - \sqrt{29}, 4 + \sqrt{29}\}$

B) $\{4 - \sqrt{13}, 4 + \sqrt{13}\}$

C) $\{8 - \sqrt{77}, 8 + \sqrt{77}\}$

D) $\{-4 - \sqrt{29}, -4 + \sqrt{29}\}$

Objective: (1.2) Solve a Quadratic Equation by Completing the Square

94) $\frac{1}{4}x^2 + \frac{1}{16}x - \frac{1}{8} = 0$

A) $\{\frac{\sqrt{33} - 1}{8}, -\frac{\sqrt{33} + 1}{8}\}$

B) $\{\frac{1}{8}, -\frac{1}{8}\}$

C) $\{\frac{\sqrt{33}}{8}, -\frac{\sqrt{33}}{8}\}$

D) $\{\frac{\sqrt{33} - 1}{8}, \frac{\sqrt{33} + 1}{8}\}$

Objective: (1.2) Solve a Quadratic Equation by Completing the Square

95) $3x^2 - 2x - 6 = 0$

A) $\{-6, \frac{20}{3}\}$

B) $\{\frac{3 - \sqrt{19}}{9}, \frac{3 + \sqrt{19}}{9}\}$

C) $\{\frac{-1 - \sqrt{19}}{3}, \frac{-1 + \sqrt{19}}{3}\}$

D) $\{\frac{1 - \sqrt{19}}{3}, \frac{1 + \sqrt{19}}{3}\}$

Objective: (1.2) Solve a Quadratic Equation by Completing the Square

96) $25x^2 + 30x + 8 = 0$

A) $\{-\frac{4}{25}, \frac{12}{25}\}$ B) $\{-\frac{2}{5}, -\frac{4}{5}\}$ C) $\{\frac{2}{5}, \frac{4}{5}\}$ D) $\{-\frac{2}{25}, -\frac{4}{25}\}$

Objective: (1.2) Solve a Quadratic Equation by Completing the Square

97) $x^2 + \frac{3}{2}x + \frac{5}{16} = 0$

A) $\{-\frac{1}{4}, -\frac{5}{4}\}$ B) $\{-\frac{1}{4}, \frac{5}{4}\}$ C) $\{\frac{1}{4}, \frac{5}{4}\}$ D) $\{\frac{1}{4}, -\frac{5}{4}\}$

Objective: (1.2) Solve a Quadratic Equation by Completing the Square

Find the real solutions, if any, of the equation. Use the quadratic formula.

98) $x^2 + 4x - 3 = 0$

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

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

Objective: (1.2) Solve a Quadratic Equation Using the Quadratic Formula

99) $x^2 - 4x - 15 = 0$

A) $\{-2 + \sqrt{19}, -2 - \sqrt{19}\}$ B) $\{2 + \sqrt{15}, 2 - \sqrt{15}\}$

C) $\{2 + \sqrt{19}, 2 - \sqrt{19}\}$ D) $\{4 + \sqrt{19}, 4 - \sqrt{19}\}$

Objective: (1.2) Solve a Quadratic Equation Using the Quadratic Formula

100) $3x^2 + 7x - 20 = 0$

A) $\{-\frac{5}{3}, -4\}$ B) $\{-\frac{5}{3}, 4\}$ C) $\{\frac{5}{3}, 4\}$ D) $\{\frac{5}{3}, -4\}$

Objective: (1.2) Solve a Quadratic Equation Using the Quadratic Formula

101) $2x^2 - x + 4 = 0$

A) $\{\frac{-1 - \sqrt{33}}{4}, \frac{1 + \sqrt{33}}{4}\}$ B) $\{\frac{-1 - \sqrt{33}}{4}, \frac{-1 + \sqrt{33}}{4}\}$

C) $\{\frac{-1 + \sqrt{33}}{4}, \frac{1 + \sqrt{33}}{4}\}$ D) no real solution

Objective: (1.2) Solve a Quadratic Equation Using the Quadratic Formula

102) $x^2 + 7x + 2 = 0$

A) $\{\frac{-7 - \sqrt{41}}{2}, \frac{-7 + \sqrt{41}}{2}\}$ B) $\{\frac{-7 - \sqrt{41}}{14}, \frac{-7 + \sqrt{41}}{14}\}$

C) $\{\frac{7 - \sqrt{41}}{2}, \frac{7 + \sqrt{41}}{2}\}$ D) $\{\frac{-7 - \sqrt{57}}{2}, \frac{-7 + \sqrt{57}}{2}\}$

Objective: (1.2) Solve a Quadratic Equation Using the Quadratic Formula

103) $5x^2 + x - 5 = 0$

A) $\{\frac{-1 - \sqrt{101}}{2}, \frac{-1 + \sqrt{101}}{2}\}$ B) $\{\frac{1 - \sqrt{101}}{10}, \frac{1 + \sqrt{101}}{10}\}$

C) $\{\frac{-1 - \sqrt{101}}{10}, \frac{-1 + \sqrt{101}}{10}\}$ D) no real solution

Objective: (1.2) Solve a Quadratic Equation Using the Quadratic Formula

104) $4x^2 + 12x + 2 = 0$

A) $\{\frac{-12 - \sqrt{7}}{2}, \frac{-12 + \sqrt{7}}{2}\}$

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

C) $\{\frac{-3 - \sqrt{11}}{2}, \frac{-3 + \sqrt{11}}{2}\}$

D) $\{\frac{-3 - \sqrt{7}}{8}, \frac{-3 + \sqrt{7}}{8}\}$

Objective: (1.2) Solve a Quadratic Equation Using the Quadratic Formula

105) $12x = 2x^2$

A) {0}

B) {0, - 6}

C) {0, 6}

D) {6, - 6}

Objective: (1.2) Solve a Quadratic Equation Using the Quadratic Formula

106) $16x^2 - 56x + 49 = 0$

A) $\{\frac{7}{4}, -28\}$

B) $\{-\frac{7}{4}\}$

C) $\{\frac{7}{4}\}$

D) no real solution

Objective: (1.2) Solve a Quadratic Equation Using the Quadratic Formula

107) $4x^2 + 9 = -20x$

A) $\{-\frac{1}{4}, -\frac{9}{4}\}$

B) $\{-\frac{9}{4}, \frac{9}{2}\}$

C) $\{\frac{1}{2}, \frac{9}{2}\}$

D) $\{-\frac{1}{2}, -\frac{9}{2}\}$

Objective: (1.2) Solve a Quadratic Equation Using the Quadratic Formula

108) $4x^2 + 6x = -1$

A) $\{\frac{-3 - \sqrt{13}}{4}, \frac{-3 + \sqrt{13}}{4}\}$

B) $\{\frac{-3 - \sqrt{5}}{8}, \frac{-3 + \sqrt{5}}{8}\}$

C) $\{\frac{-6 - \sqrt{5}}{4}, \frac{-6 + \sqrt{5}}{4}\}$

D) $\{\frac{-3 - \sqrt{5}}{4}, \frac{-3 + \sqrt{5}}{4}\}$

Objective: (1.2) Solve a Quadratic Equation Using the Quadratic Formula

109) $2x^2 = -10x - 6$

A) $\{\frac{-5 - \sqrt{13}}{2}, \frac{-5 + \sqrt{13}}{2}\}$

B) $\{\frac{-5 - \sqrt{37}}{2}, \frac{-5 + \sqrt{37}}{2}\}$

C) $\{\frac{-10 - \sqrt{13}}{2}, \frac{-10 + \sqrt{13}}{2}\}$

D) $\{\frac{-5 - \sqrt{13}}{4}, \frac{-5 + \sqrt{13}}{4}\}$

Objective: (1.2) Solve a Quadratic Equation Using the Quadratic Formula

110) $4x = 1 + \frac{-7}{x}$

A) $\{\frac{1 - \sqrt{113}}{8}\}$

B) $\{-\frac{1 + \sqrt{113}}{8}, \frac{1 - \sqrt{113}}{8}\}$

C) $\{\frac{1 - \sqrt{113}}{8}, \frac{1 + \sqrt{113}}{8}\}$

D) no real solution

Objective: (1.2) Solve a Quadratic Equation Using the Quadratic Formula

Find the real solutions, if any, of the equation. Use the quadratic formula and a calculator. Express any solutions rounded to two decimal places.

111) $x^2 + \sqrt{3}x - 3 = 0$

A) {-2.8, 1.07} B) {-2.8, 2.8} C) {-1.07, 2.8} D) {-2.8, -1.07}

Objective: (1.2) Solve a Quadratic Equation Using the Quadratic Formula

Find the real solutions, if any, of the equation. Use the quadratic formula and a calculator. Express any solutions rounded to two decimal places. Use 3.14 to approximate π.

112) $\pi x^2 + \pi x - 4 = 0$

A) {-1.73, 0.73} B) {-1.73, -0.73} C) {0.73, 1.73} D) {-0.73, 1.73}

Objective: (1.2) Solve a Quadratic Equation Using the Quadratic Formula

Use the discriminant to determine whether the quadratic equation has two unequal real solutions, a repeated real solution, or no real solution without solving the equation.

113) $x^2 - 6x + 5 = 0$

A) repeated real solution B) two unequal real solutions C) no real solution

Objective: (1.2) Solve a Quadratic Equation Using the Quadratic Formula

114) $x^2 - 6x + 9 = 0$

A) repeated real solution B) two unequal real solutions C) no real solution

Objective: (1.2) Solve a Quadratic Equation Using the Quadratic Formula

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

A) repeated real solution B) two unequal real solutions C) no real solution

Objective: (1.2) Solve a Quadratic Equation Using the Quadratic Formula

Solve using the quadratic formula. Round any answers to two decimal places.

116) $\frac{1}{4}x^2 - 2\sqrt{3}x = 3$

A) {-0.82, 14.67} B) {-0.21, 14.67} C) {0.21, -14.67} D) {0.82, -14.67}

Objective: (1.2) Solve a Quadratic Equation Using the Quadratic Formula

Solve the problem.

117) The length of a vegetable garden is 7 feet longer than its width. If the area of the garden is 98 square feet, find its dimensions.

A) 8 ft by 15 ft B) 6 ft by 13 ft C) 7 ft by 14 ft D) 6 ft by 15 ft

Objective: (1.2) Solve Problems That Can Be Modeled by Quadratic Equations

118) The area of a circle is found by the equation $A = \pi r^2$. If the area A of a certain circle is 81π square centimeters, find its radius r.

A) 9 cm B) 9π cm C) {9 cm, -9 cm} D) $9\sqrt{\pi}$ cm

Objective: (1.2) Solve Problems That Can Be Modeled by Quadratic Equations

119) A 33-inch-square TV is on sale at the local electronics store. If 33 inches is the measure of the diagonal of the screen, use the Pythagorean theorem to find the length of the side of the screen.

A) $\frac{\sqrt{33}}{2}$ in. B) $\frac{1,089}{2}$ in. C) $\frac{33\sqrt{2}}{2}$ in. D) $\sqrt{33}$ in.

Objective: (1.2) Solve Problems That Can Be Modeled by Quadratic Equations

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

120) The surface area A of a right circular cylinder is $A = 2\pi r^2 + 2\pi rh$, where r is the radius and h is the height. Find the radius of a right circular cylinder whose surface area is 95.36π square inches and whose height is 11.7 inches.

Objective: (1.2) Solve Problems That Can Be Modeled by Quadratic Equations

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

121) An open box is to be constructed from a square sheet of plastic by removing a square of side 4 inches from each corner, and then turning up the sides. If the box must have a volume of 1,600 cubic inches, find the length of one side of the open box.

A) 28 in. B) 20 in. C) 24 in. D) 19 in.

Objective: (1.2) Solve Problems That Can Be Modeled by Quadratic Equations

122) A ball is thrown vertically upward from the top of a building 112 feet tall with an initial velocity of 96 feet per second. The distance s (in feet) of the ball from the ground after t seconds is $s = 112 + 96t - 16t^2$. After how many seconds will the ball pass the top of the building on its way down?

A) 7 sec B) 6 sec C) 9 sec D) 113 sec

Objective: (1.2) Solve Problems That Can Be Modeled by Quadratic Equations

123) As part of a physics experiment, Ming drops a baseball from the top of a 350-foot building. To the nearest tenth of a second, for how many seconds will the baseball fall? (Hint: Use the formula $h = 16t^2$, which gives the distance h, in feet, that a free-falling object travels in t seconds.)

A) 4.7 sec B) 1.2 sec C) 87.5 sec D) 21.9 sec

Objective: (1.2) Solve Problems That Can Be Modeled by Quadratic Equations

124) The net income y (in millions of dollars) of Pet Products Unlimited from 1997 to 1999 is given by the equation $y = 9x^2 + 15x + 52$, where x represents the number of years after 1997. Assume this trend continues and predict the year in which Pet Products Unlimited's net income will be $352 million.

A) 2,002 B) 2,001 C) 2,004 D) 2,003

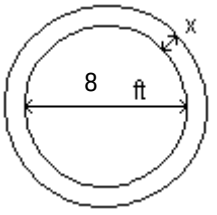
Objective: (1.2) Solve Problems That Can Be Modeled by Quadratic Equations

125) The formula $A = P(1 + r)^2$ is used to find the amount of money, A, in an account after P dollars have been invested in the account paying an annual interest rate, r, for 2 years. Find the interest rate r if $500 grows to $1,125 in 2 years.

A) 125% B) 50% C) 5% D) 250%

Objective: (1.2) Solve Problems That Can Be Modeled by Quadratic Equations

126) A circular pool measures 8 feet across. One cubic yard of concrete is to be used to create a circular border of uniform width around the pool. If the border is to have a depth of 3 inches, how wide will the border be? Use 3.14 to approximate π. Express your solution rounded to two decimal places. (1 cubic yard = 27 cubic feet)



A) 2.88 ft B) 3.1 ft C) 8.37 ft D) 5.43 ft

Objective: (1.2) Solve Problems That Can Be Modeled by Quadratic Equations

127) If a polygon, of n sides has $\frac{1}{2}n(n - 3)$ diagonals, how many sides will a polygon with 230 diagonals have?

A) 23 sides B) 24 sides C) 25 sides D) 22 sides

Objective: (1.2) Solve Problems That Can Be Modeled by Quadratic Equations

Write the expression in the standard form a + bi.

128) (9 - 6i) + (8 + 8i)

A) 17 - 2i B) 17 + 2i C) 1 + 14i D) -17 - 2i

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

129) (7 + 8i) - (-8 + i)

A) -15 - 7i B) -1 + 9i C) 15 + 7i D) 15 - 7i

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

130) 8(8 - 8i)

A) 64 + 64i B) 64 - 64i C) 64i - 8i D) 8 - 64i

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

131) 2i(3 - 4i)

A) $6i - 8i^2$ B) 8+ 6i C) $6i + 8i^2$ D) 6i - 8

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

132) -2i(-7 + 8i)

A) -16 + 14i B) $14i - 16i^2$ C) 16 + 14i D) $14i + 16i^2$

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

133) (-4 - 7i)(3 + i)

A) -19 - 25i B) -5 + 17i C) -19 + 17i D) -5 - 25i

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

134) (7 + 3i)(2 + 8i)

A) 38 - 50i B) -10 + 62i C) $24i^2 + 62i + 14$ D) -10 - 62i

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

135) $(9 + 7i)(3 - 4i)$

A) $-28i^2 - 15i + 27$ B) $55 - 15i$ C) $55 + 15i$ D) $-1 + 57i$

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

136) $(5 + 6i)(5 - 6i)$

A) -11 B) $25 - 36i$ C) $25 - 36i^2$ D) 61

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

137) $(-7 + i)(-7 - i)$

A) -7 B) 49 C) 50 D) -48

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

138) $(9 + 5i)(9 - 5i)$

A) 56 B) $81 - 25i^2$ C) $81 - 25i$ D) 106

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

139) $\frac{7}{7 + i}$

A) $\frac{49}{50} + \frac{7}{50}i$ B) $\frac{49}{48} - \frac{7}{48}i$ C) $\frac{49}{48} + \frac{7}{48}i$ D) $\frac{49}{50} - \frac{7}{50}i$

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

140) $\frac{9}{7 - i}$

A) $\frac{63}{50} + \frac{9}{50}i$ B) $\frac{63}{50} - \frac{9}{50}i$ C) $\frac{21}{16} - \frac{3}{16}i$ D) $\frac{21}{16} + \frac{3}{16}i$

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

141) $\frac{9}{6 - 8i}$

A) $\frac{27}{50} + \frac{18}{25}i$ B) $-\frac{27}{14} + \frac{18}{7}i$ C) $\frac{27}{50} - \frac{18}{25}i$ D) $-\frac{27}{14} - \frac{18}{7}i$

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

142) $\frac{2i}{1 - i}$

A) $-1 + 2i$ B) $-1 + i$ C) $-1 - i$ D) $1 + i$

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

143) $\frac{4 - 7i}{7 + 4i}$

A) $-i$ B) i C) 1 D) -1

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

144) $\frac{-12 - 48i}{3 - 5i}$

A) $-6 - 6i$ B) $6 + 6i$ C) $6 - 6i$ D) $-6 + 6i$

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

145) $\frac{6 + 2i}{5 - 3i}$

A) $\frac{9}{4} - \frac{7}{8}i$ B) $\frac{36}{17} + \frac{8}{17}i$ C) $\frac{3}{4} - \frac{7}{8}i$ D) $\frac{12}{17} + \frac{14}{17}i$

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

146) $(5 + 7i)^2$

A) $74 + 70i$ B) -24 C) $-24 + 70i$ D) $25 + 70i + 49i^2$

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

147) $\left(\frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2}i\right)^2$

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

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

148) i^{12}

A) $-i$ B) -1 C) i D) 1

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

149) i^{15}

A) $-i$ B) i C) -1 D) 1

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

150) i^{17}

A) 1 B) i C) $-i$ D) -1

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

151) i^{10}

A) i B) 1 C) -1 D) $-i$

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

152) $2i^{15} - i^7$

A) -1 B) 1 C) i D) $-i$

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

153) $5i^5(1 + i^3)$

A) $5 + 5i$ B) $-5 - 5i$ C) $5 - 5i$ D) $-5 + 5i$

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

154) $(1 + i)^5$

A) $4 - 4i$ B) $-4 + 4i$ C) $-4 - 4i$ D) $-4 + i$

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

155) $i^{14} + i^{12} + i^{10} + 1$

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

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

Perform the indicated operations and express your answer in the form a + bi.

156) $\sqrt{-16}$

A) $-i\sqrt{4}$ B) ± 4 C) $-4i$ D) $4i$

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

157) $\sqrt{-81}$

A) $-9i$ B) ± 9 C) $i\sqrt{9}$ D) $9i$

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

158) $\sqrt{(8 + 6i)(6i - 8)}$

A) 10 B) $-10i$ C) -10 D) $10i$

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

Write the expression in the standard form a + bi.

159) If $z = 9 - 3i$, evaluate $z + \overline{z}$.

A) $-6i$ B) $18 - 6i$ C) 18 D) $18 + 6i$

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

160) If $w = 8 + 6i$, evaluate $w - \overline{w}$.

A) $12i$ B) 0 C) 16 D) $-16 + 12i$

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

161) If $z = 4 - 6i$, evaluate $z\overline{z}$.

A) $16 - 36i$ B) 52 C) -20 D) $16 - 36i^2$

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

162) If $z = 6 + 6i$ and $w = -3 + i$, evaluate $\overline{z - w}$.

A) $9 - 5i$ B) $3 + 7i$ C) $-9 - 5i$ D) $9 + 5i$

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

163) If $z = 7 - 9i$ and $w = 6 + 7i$, evaluate $\overline{z} + \overline{w}$.

A) $1 + 16i$ B) $13 - 2i$ C) $13 + 2i$ D) $-13 + 2i$

Objective: (1.3) Add, Subtract, Multiply, and Divide Complex Numbers

Solve the equation in the complex number system.

164) $x^2 + 49 = 0$

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

Objective: (1.3) Solve Quadratic Equations in the Complex Number System

165) $x^2 - 12x + 61 = 0$

A) {6 + 5i} B) {6 - 25i, 6 + 25i} C) {6 - 5i, 6 + 5i} D) {1, 11}

Objective: (1.3) Solve Quadratic Equations in the Complex Number System

166) $x^2 + x + 2 = 0$

A) $\{\frac{1 - \sqrt{7}}{2}, \frac{1 + \sqrt{7}}{2}\}$

B) $\{\frac{-1 - \sqrt{7}}{2}, \frac{-1 + \sqrt{7}}{2}\}$

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

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

Objective: (1.3) Solve Quadratic Equations in the Complex Number System

167) $16x^2 + 1 = 5x$

A) $\{\frac{5}{32} - \frac{\sqrt{39}}{32}i, -\frac{5}{32} + \frac{\sqrt{39}}{32}i\}$

B) $\{\frac{5}{32} - \frac{\sqrt{39}}{32}i, \frac{5}{32} + \frac{\sqrt{39}}{32}i\}$

C) $\{-\frac{5}{32} - \frac{\sqrt{39}}{32}i, -\frac{5}{32} + \frac{\sqrt{39}}{32}i\}$

D) $\{-\frac{5}{32} - \frac{\sqrt{39}}{32}i, \frac{5}{32} + \frac{\sqrt{39}}{32}i\}$

Objective: (1.3) Solve Quadratic Equations in the Complex Number System

168) $x^3 - 125 = 0$

A) $\{5, -\frac{5}{2} - \frac{5\sqrt{3}}{2}i, -\frac{5}{2} + \frac{5\sqrt{3}}{2}i\}$

B) $\{5, -\frac{5}{2} - \frac{5\sqrt{3}}{2}, -\frac{5}{2} + \frac{5\sqrt{3}}{2}\}$

C) {5}

D) {5, -5i, 5i}

Objective: (1.3) Solve Quadratic Equations in the Complex Number System

169) $x^4 = 16$

A) {-2, 2, 2i} B) {-2, 2} C) {2} D) {-2, 2, -2i, 2i}

Objective: (1.3) Solve Quadratic Equations in the Complex Number System

170) $x^4 - 6x^2 - 7 = 0$

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

Objective: (1.3) Solve Quadratic Equations in the Complex Number System

Without solving, determine the character of the solutions of the equation in the complex number system.

171) $x^2 + 2x - 3 = 0$

A) a repeated real solution
B) two unequal real solutions
C) two complex solutions that are conjugates of each other

Objective: (1.3) Solve Quadratic Equations in the Complex Number System

172) $x^2 - 12x + 36 = 0$

A) a repeated real solution
B) two complex solutions that are conjugates of each other
C) two unequal real solutions

Objective: (1.3) Solve Quadratic Equations in the Complex Number System

173) $x^2 + 4x + 7 = 0$

A) two unequal real solutions
B) two complex solutions that are conjugates of each other
C) a repeated real solution

Objective: (1.3) Solve Quadratic Equations in the Complex Number System

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

A) two complex solutions that are conjugates of each other
B) two unequal real solutions
C) a repeated real solution

Objective: (1.3) Solve Quadratic Equations in the Complex Number System

Solve the problem.

175) 1 - i is a solution of a quadratic equation with real coefficients. Find the other solution.

A) 1 - i B) 1 + i C) -1 - i D) -1 + i

Objective: (1.3) Solve Quadratic Equations in the Complex Number System

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Write the expression in the standard form a + bi.

176) If $z = 3 - 6i$ and $w = 1 + 5i$, evaluate $\overline{z + w}$.

Objective: (1.3) Solve Quadratic Equations in the Complex Number System

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

Find the real solutions of the equation.

177) $\sqrt{x + 2} = 9$

A) {81} B) {79} C) {83} D) {121}

Objective: (1.4) Solve Radical Equations

178) $\sqrt{3x - 2} = 2$

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

Objective: (1.4) Solve Radical Equations

179) $\sqrt{5x + 6} = 6$

A) {6} B) $\{\frac{42}{5}\}$ C) {36} D) $\{\frac{36}{5}\}$

Objective: (1.4) Solve Radical Equations

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

180) $\sqrt[3]{4x - 5} + 7 = 8$

Objective: (1.4) Solve Radical Equations

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

181) $\sqrt[3]{2x + 1} = -5$

A) {12} B) $\{-\frac{127}{2}\}$ C) {- 63} D) $\{-\frac{125}{2}\}$

Objective: (1.4) Solve Radical Equations

182) $\sqrt[5]{1 - x} = -2$

A) {33} B) {-33} C) {32} D) {-32}

Objective: (1.4) Solve Radical Equations

183) $\sqrt[3]{1 + x} = -1$

A) {-2} B) {-1} C) {1} D) {2}

Objective: (1.4) Solve Radical Equations

184) $x = 6\sqrt{x}$

A) {0, 6} B) {-6, 6} C) {-36, 36} D) {0, 36}

Objective: (1.4) Solve Radical Equations

185) $\sqrt{5x + 36} = x$

A) {9} B) {- 9} C) {-4, 9} D) no real solution

Objective: (1.4) Solve Radical Equations

186) $\sqrt{26x + 13} = x + 7$

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

Objective: (1.4) Solve Radical Equations

187) $\sqrt{x + 7} + \sqrt{x} = 3$

A) {4} B) {1} C) $\{\frac{1}{9}\}$ D) no real solution

Objective: (1.4) Solve Radical Equations

188) $\sqrt{x^2 - 3x + 64} = x + 5$

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

Objective: (1.4) Solve Radical Equations

189) $\sqrt{x^2 - 3x + 83} = x + 7$

A) {2} B) {-5} C) {-2} D) {9}

Objective: (1.4) Solve Radical Equations

190) $\sqrt{x^2 + 2} - \sqrt{2x + 5} = 0$

A) {3, -1} B) {3} C) {-3, 1} D) no real solution

Objective: (1.4) Solve Radical Equations

191) $\sqrt{2x + 3} - \sqrt{x + 1} = 1$

A) {3} B) {3, -1} C) {-3, -1} D) no real solution

Objective: (1.4) Solve Radical Equations

192) $\sqrt{2x + 5} - \sqrt{x - 2} = 3$

A) {-2} B) {2} C) {3, 8} D) {2, 38}

Objective: (1.4) Solve Radical Equations

193) $\sqrt{3x + 10} - \sqrt{x + 2} = 2$

A) {-2} B) {-3} C) {-2, 2} D) {2}

Objective: (1.4) Solve Radical Equations

194) $\sqrt{2 - 3\sqrt{x}} = 6$

A) $\{\sqrt{-\frac{34}{3}}\}$ B) $\{\sqrt{\frac{34}{3}}\}$ C) $\{\sqrt{\frac{2}{3}}\}$ D) no real solution

Objective: (1.4) Solve Radical Equations

195) $(3x - 7)^{1/2} = 4$

A) $\{\frac{11}{3}\}$ B) $\{\frac{23}{3}\}$ C) $\{\frac{22}{3}\}$ D) no real solution

Objective: (1.4) Solve Radical Equations

196) $(2x + 3)^{1/2} = 5$

A) $\{\frac{25}{2}\}$ B) {6} C) {11} D) $\{-\frac{3}{2}\}$

Objective: (1.4) Solve Radical Equations

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

197) $\sqrt[3]{4x - 5} + 7 = 8$

Objective: (1.4) Solve Radical Equations

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

198) $(5x + 2)^{1/3} = 4$

A) $\{\frac{59}{2}\}$ B) $\{\frac{14}{5}\}$ C) $\{\frac{62}{5}\}$ D) $\{\frac{64}{5}\}$

Objective: (1.4) Solve Radical Equations

199) $(x + 3)^{1/3} = -2$

A) {1} B) {-9} C) {-11} D) no real solution

Objective: (1.4) Solve Radical Equations

200) $(x^2 - 1)^{1/2} = 12$

A) $\{\sqrt{145}, -\sqrt{145}\}$ B) {145, -145} C) {13} D) $\{\sqrt{13}\}$

Objective: (1.4) Solve Radical Equations

201) $x^{3/2} - 9x^{1/2} = 0$

A) $\{\sqrt{2}\}$ B) $\{3\}$ C) $\{0, 9\}$ D) $\{0, 81\}$

Objective: (1.4) Solve Radical Equations

202) $x^{5/4} - 4x^{1/4} = 0$

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

Objective: (1.4) Solve Radical Equations

203) $x^4 - 5x^2 + 4 = 0$

A) $\{-4, 4\}$ B) $\{-1, 1, -2, 2\}$ C) $\{-2, 2\}$ D) $\{-5, 5\}$

Objective: (1.4) Solve Equations Quadratic in Form

204) $5x^4 + 13x^2 - 6 = 0$

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

Objective: (1.4) Solve Equations Quadratic in Form

205) $x^6 + 63x^3 - 64 = 0$

A) $\{4\}$ B) $\{4, -1\}$ C) $\{-4, 1\}$ D) $\{64\}$

Objective: (1.4) Solve Equations Quadratic in Form

206) $2(x + 1)^2 + 13(x + 1) + 20 = 0$

A) $\{-\frac{7}{2}, -4\}$ B) $\{-\frac{7}{2}, -5\}$ C) $\{-\frac{5}{2}, -5\}$ D) $\{2, 3\}$

Objective: (1.4) Solve Equations Quadratic in Form

207) $(2x - 4)^2 - 6(2x - 4) + 5 = 0$

A) $\{-\frac{3}{4}, \frac{1}{2}\}$ B) $\{-\frac{5}{2}, -\frac{9}{2}\}$ C) $\{\frac{3}{2}, -\frac{1}{2}\}$ D) $\{\frac{5}{2}, \frac{9}{2}\}$

Objective: (1.4) Solve Equations Quadratic in Form

208) $(x - 4)^2 + 3(x - 4) - 18 = 0$

A) $\{-1, 6\}$ B) $\{-6, 1\}$ C) $\{-7, 2\}$ D) $\{-2, 7\}$

Objective: (1.4) Solve Equations Quadratic in Form

209) $x + \sqrt{x} = 20$

A) $\{16\}$ B) $\{5\}$ C) $\{4\}$ D) $\{25\}$

Objective: (1.4) Solve Equations Quadratic in Form

210) $x + 3x^{1/2} + 2 = 0$

A) $\{-1, -2\}$ B) $\{\frac{1}{4}\}$ C) $\{1, 4\}$ D) no real solution

Objective: (1.4) Solve Equations Quadratic in Form

211) $x^{1/2} - 6x^{1/4} + 8 = 0$

A) {4, 16} B) {2, 4} C) {16, 256} D) {-2, -4}

Objective: (1.4) Solve Equations Quadratic in Form

212) $x^2 + 5x - \sqrt{x^2 + 5x} = 12$

A) {3} B) {5}

C) $\{\frac{-5 + \sqrt{89}}{2}, \frac{-5 - \sqrt{89}}{2}\}$ D) {25, -25}

Objective: (1.4) Solve Equations Quadratic in Form

213) $\frac{1}{(x - 2)^2} - \frac{2}{x - 2} = 3$

A) $\{1, \frac{1}{3}\}$ B) $\{1, \frac{7}{3}\}$ C) $\{-1, \frac{1}{3}\}$ D) $\{-1, \frac{7}{3}\}$

Objective: (1.4) Solve Equations Quadratic in Form

214) $2 + \frac{5}{2x - 1} = \frac{-2}{(2x - 1)^2}$

A) $\{-\frac{1}{2}, 0\}$ B) $\{-\frac{1}{2}, -\frac{1}{4}\}$ C) $\{-2, -\frac{1}{2}\}$ D) $\{-\frac{1}{2}, \frac{1}{4}\}$

Objective: (1.4) Solve Equations Quadratic in Form

215) $4x^{-2} - 11x^{-1} - 3 = 0$

A) $\{-4, \frac{1}{3}\}$ B) $\{-\frac{1}{4}, 3\}$ C) $\{4, \frac{1}{3}\}$ D) $\{-\frac{1}{4}, -3\}$

Objective: (1.4) Solve Equations Quadratic in Form

216) $x^{2/3} - 3x^{1/3} - 10 = 0$

A) {-125, 8} B) {-5, 2} C) {-2, 5} D) {-8, 125}

Objective: (1.4) Solve Equations Quadratic in Form

217) $x^{2/3} - 9x^{1/3} + 20 = 0$

A) {-125, -64} B) {64, 125} C) {4, 5} D) {-5, -4}

Objective: (1.4) Solve Equations Quadratic in Form

Find the real solutions of the equation. Use a calculator to express the solutions rounded to two decimal places.

218) $\pi(1 + x)^2 - 5 = 2(1 + x)$

A) {-0.62, 0.82} B) {0.62, -1.98} C) {-0.62, -0.18} D) {-1.62, -0.62}

Objective: (1.4) Solve Equations Quadratic in Form

219) $x^{2/5} - 3x^{1/5} - 4 = 0$

A) {-1, 4} B) {-1, 1.32} C) {-1} D) {-1, 1024}

Objective: (1.4) Solve Equations Quadratic in Form

Solve the problem.

220) If $k = \frac{x+3}{x-3}$ and $k^2 - 3k = 18$, find x.

A) $\{\frac{21}{5}, \frac{1}{4}\}$ B) $\{\frac{21}{5}, \frac{3}{2}\}$ C) $\{\frac{7}{2}, \frac{3}{2}\}$ D) $\{6, \frac{3}{2}\}$

Objective: (1.4) Solve Equations Quadratic in Form

221) For a cone, the formula $r = \sqrt{\frac{3V}{\pi h}}$ describes the relationship between the radius r of the base, the volume V, and the height h. Find the volume if the radius is 7 inches and the cone is 9 inches high. (Use 3.14 as an approximation for π, and round to the nearest tenth.)

A) 51.3 cubic in. B) 461.6 cubic in. C) 65.9 cubic in. D) 4,154.2 cubic in.

Objective: (1.4) Solve Equations Quadratic in Form

222) The formula $v = \sqrt{2.5r}$ can be used to estimate the maximum safe velocity v, in miles per hour, at which a car can travel along a curved road with a radius of curvature r, in feet. To the nearest whole number, find the radius of curvature if the maximum safe velocity is 15 miles per hour.

A) 563 ft B) 90 ft C) 36 ft D) 225 ft

Objective: (1.4) Solve Equations Quadratic in Form

223) The function $f(x) = 6.75\sqrt{x} + 12$ models the amount, f(x), in billions of dollars of new student loans x years after 1993. According to the model, in what year is the amount loaned expected to reach $25.5 billion?

A) 2,001 B) 2,000 C) 2,002 D) 1,997

Objective: (1.4) Solve Equations Quadratic in Form

224) When an object is dropped to the ground from a height of h meters, the time it takes for the object to reach the ground is given by the equation $t = \sqrt{\frac{h}{4.9}}$, where t is measured in seconds. Solve the equation for h. Use the result to determine the height from which an object was dropped if it hits the ground after falling for 6 seconds.

A) $h = 4.9t^2$; 176.4 meters B) $h = 24.01t^2$; 864.4 meters

C) $h = 4.9t$; 29.4 meters D) $h = 24.01t$; 144.1 meters

Objective: (1.4) Solve Equations Quadratic in Form

225) The maximum number of volts, E, that can be placed across a resistor is given by the formula $E = \sqrt{PR}$, where P is the number of watts of power that the resistor can absorb and R is the resistance of the resistor in ohms. Solve this equation for R. Use the result to determine the resistance of a resistor if P is $\frac{1}{8}$ watts and E is 40 volts.

A) $R = E^2P$; 12,800 ohms B) $R = \frac{E^2}{P}$; 12,800 ohms

C) $R = \frac{E^2}{P^2}$; 102,400 ohms D) $R = E^2P^2$; 102,400 ohms

Objective: (1.4) Solve Equations Quadratic in Form

226) The number of centimeters, d, that a spring is compressed from its natural, uncompressed position is given by the formula $d = \sqrt{\frac{2W}{k}}$, where W is the number of joules of work done to move the spring and k is the spring constant. Solve this equation for W. Use the result to determine the work needed to move a spring 9 centimeters if it has a spring constant of 0.2.

A) $W = \frac{d^2k^2}{4}$; 0.8 joules

B) $W = 2d^2k$; 32.4 joules

C) $W = \frac{d^2k}{2}$; 8.1 joules

D) $W = \frac{2d^2}{k}$; 810 joules

Objective: (1.4) Solve Equations Quadratic in Form

Find the real solutions of the equation by factoring.

227) $x^3 - 36x = 0$

A) {0, 6, -6} B) {0, -6} C) {0, 6} D) {0, 36}

Objective: (1.4) Solve Equations by Factoring

228) $2x^5 = 162x^3$

A) {-9, 0, 9} B) {0} C) $\{-9\sqrt{2}, 0, 9\sqrt{2}\}$ D) {-9, 9}

Objective: (1.4) Solve Equations by Factoring

229) $x^3 + 6x^2 - 16x - 96 = 0$

A) {4, -6} B) {16, -6} C) {-4, 4, -6} D) {-4, 4, 6}

Objective: (1.4) Solve Equations by Factoring

230) $x^3 + 3x^2 + 4x + 12 = 0$

A) {-3} B) {-2, 2, -3} C) {3} D) no real solution

Objective: (1.4) Solve Equations by Factoring

231) $3x^4 - 27x^2 = 0$

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

Objective: (1.4) Solve Equations by Factoring

232) $2x^4 = 128x$

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

Objective: (1.4) Solve Equations by Factoring

233) $x^3 + 7x^2 + 12x = 0$

A) {-3, -4} B) {3, 4} C) {0, 3, 4} D) {0, -3, -4}

Objective: (1.4) Solve Equations by Factoring

234) $x^3 + 3x^2 - x - 3 = 0$

A) {-3, 3} B) {-1, 1, -3} C) {9} D) {1, -3, 3}

Objective: (1.4) Solve Equations by Factoring

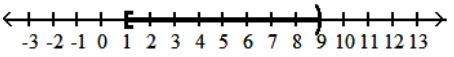
235) $8x^3 + 64x^2 + 120x = 0$

A) $\{-\frac{1}{3}, -5\}$ B) $\{0, 3, 5\}$ C) $\{-3, -5\}$ D) $\{0, -3, -5\}$

Objective: (1.4) Solve Equations by Factoring

Express the graph shown using interval notation. Also express it as an inequality involving x.

236)



A) [1, 9)
$1 \le x < 9$

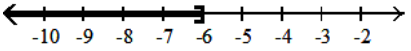
B) (1, 9)
$1 < x < 9$

C) (1, 9]
$1 < x \le 9$

D) [1, 9]
$1 \le x \le 9$

Objective: (1.5) Use Interval Notation

237)



A) $(-6, \infty)$
$x > -6$

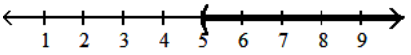
B) $(-\infty, -6)$
$x < -6$

C) $[-6, \infty)$
$x \ge -6$

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

Objective: (1.5) Use Interval Notation

238)



A) $(-\infty, 5)$
$x < 5$

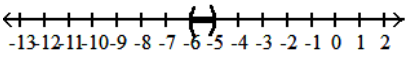
B) $[5, \infty)$
$x \ge 5$

C) $(-\infty, 5]$
$x \le 5$

D) $(5, \infty)$
$x > 5$

Objective: (1.5) Use Interval Notation

239)



A) $[-6, -5]$
$-6 \le x \le -5$

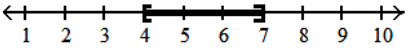
B) $(-6, -5)$
$-6 < x < -5$

C) $(-6, -5]$
$-6 < x \le -5$

D) $[-6, -5)$
$-6 \le x < -5$

Objective: (1.5) Use Interval Notation

240)



A) [4, 7]
$4 \le x \le 7$

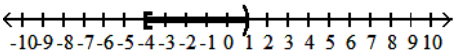
B) (4, 7]
$4 < x \le 7$

C) (4, 7)
$4 < x < 7$

D) [4, 7)
$4 \le x < 7$

Objective: (1.5) Use Interval Notation

241)



A) $(-4, 1]$
$-4 < x \leq 1$

B) $[-4, 1]$
$-4 \leq x \leq 1$

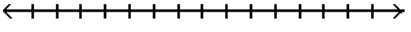
C) $[-4, 1)$
$-4 \leq x < 1$

D) $(-\infty, 1)$
$x < 1$

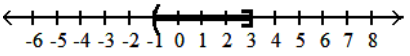
Objective: (1.5) Use Interval Notation

Write the inequality using interval notation, and illustrate the inequality using the real number line.

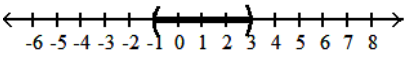
242) $-1 < x < 3$



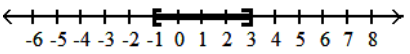
A) $(-1, 3)$



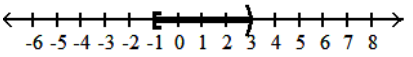
B) $(-1, 3)$



C) $[-1, 3]$

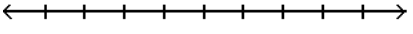


D) $[-1, 3)$

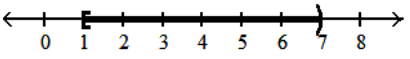


Objective: (1.5) Use Interval Notation

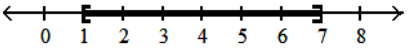
243) $1 \leq x \leq 7$



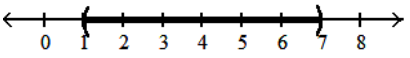
A) $[1, 7]$



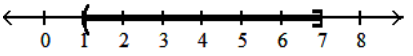
B) $[1, 7]$



C) $(1, 7)$

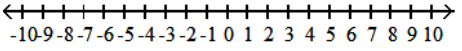


D) $(1, 7]$

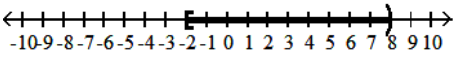


Objective: (1.5) Use Interval Notation

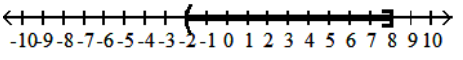
244) $-2 \leq x < 8$



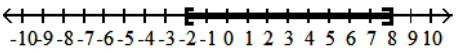
A) $[-2, 8)$



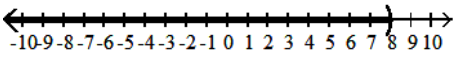
B) $(-2, 8]$



C) $[-2, 8)$

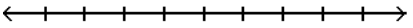


D) $(-\infty, 8)$

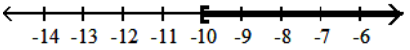


Objective: (1.5) Use Interval Notation

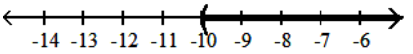
245) $t \geq -10$



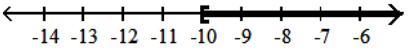
A) $[-10, \infty]$



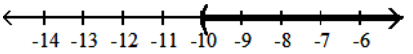
B) $(-10, \infty)$



C) $[-10, \infty)$

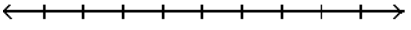


D) $(-10, \infty]$

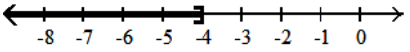


Objective: (1.5) Use Interval Notation

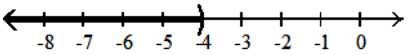
246) $y < -4$



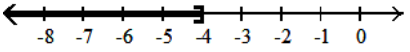
A) $(-\infty, -4]$



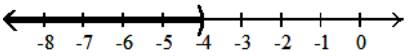
B) $[-\infty, -4)$



C) $[-\infty, -4]$



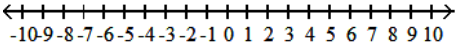
D) $(-\infty, -4)$



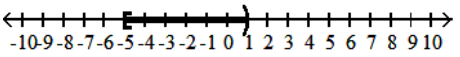
Objective: (1.5) Use Interval Notation

Write the interval as an inequality involving x, and illustrate the inequality using the real number line.

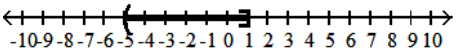
247) $[-5, 1)$



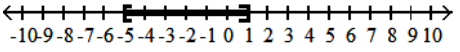
A) $-5 \leq x < 1$



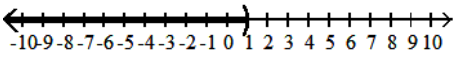
B) $-5 < x \leq 1$



C) $-5 \leq x < 1$

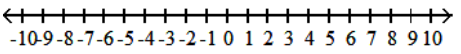


D) $x < 1$

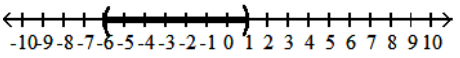


Objective: (1.5) Use Interval Notation

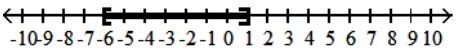
248) [-6, 1]



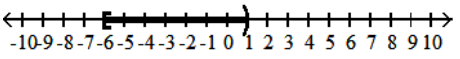
A) $-6 < x < 1$



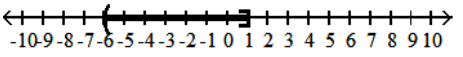
B) $-6 \leq x \leq 1$



C) $-6 \leq x < 1$

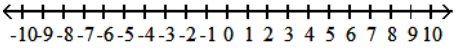


D) $-6 < x \leq 1$

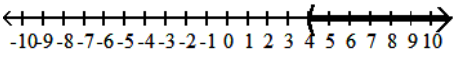


Objective: (1.5) Use Interval Notation

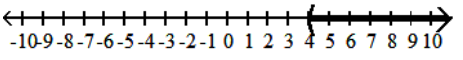
249) (4, ∞)



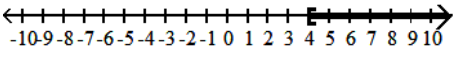
A) $x \geq 4$



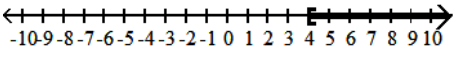
B) $x > 4$



C) $x > 4$

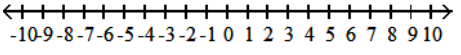


D) $x \geq 4$

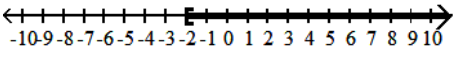


Objective: (1.5) Use Interval Notation

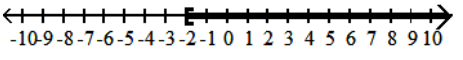
250) [-2, ∞)



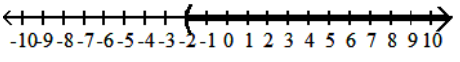
A) $x \geq -2$



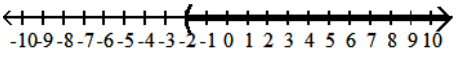
B) $x > -2$



C) $x \geq -2$

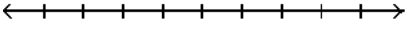


D) $x > -2$

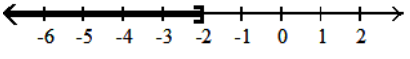


Objective: (1.5) Use Interval Notation

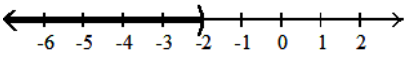
251) (-∞, -2)



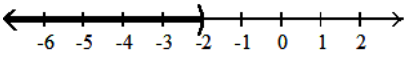
A) $x < -2$



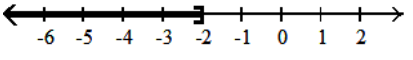
B) $x < -2$



C) $x \leq -2$



D) $x \leq -2$



Objective: (1.5) Use Interval Notation

Write the inequality obtained by performing the indicated operation on the given inequality.

252) Add 4 to each side of the inequality $5 + 5x < -4$.

A) $9 + 9x < 0$ B) $9 + 5x < 0$ C) $9 + 9x > 0$ D) $9 + 5x > 0$

Objective: (1.5) Use Properties of Inequalities

253) Multiply each side of the inequality $5 - 5x > 3$ by 3.

A) $15 - 5x < 9$ B) $15 - 5x > 9$ C) $15 - 15x > 9$ D) $15 - 15x < 9$

Objective: (1.5) Use Properties of Inequalities

Fill in the blank with the correct inequality symbol.

254) If $x < 2$, then $x - 2$ ____ 0.

A) ≤ B) > C) < D) ≥

Objective: (1.5) Use Properties of Inequalities

255) If $x < -8$, then $x + 8$ ____ 0.

A) ≤ B) > C) ≥ D) <

Objective: (1.5) Use Properties of Inequalities

256) If $x > -7$, then $4x$ ____ -28.

A) ≤ B) < C) > D) ≥

Objective: (1.5) Use Properties of Inequalities

257) If $x < 3$, then $-4x$ ____ -12.

A) ≥ B) > C) ≤ D) <

Objective: (1.5) Use Properties of Inequalities

258) If $x > -6$, then $-2x$ ____ 12.

A) ≤ B) > C) < D) ≥

Objective: (1.5) Use Properties of Inequalities

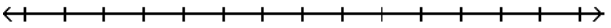
259) If $\frac{1}{4}x < -\frac{1}{4}$, then x _____ -1.

A) ≥ B) > C) ≤ D) <

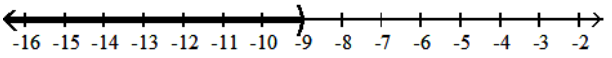
Objective: (1.5) Use Properties of Inequalities

Solve the inequality. Express your answer using interval notation.

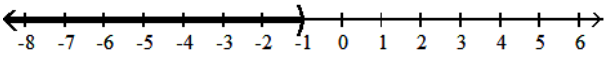
260) $x - 4 < -5$



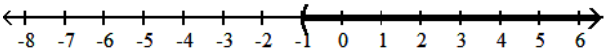
A) $(-\infty, -9)$



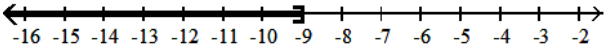
B) $(-\infty, -1)$



C) $(-1, \infty)$

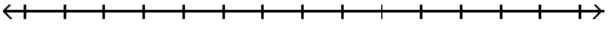


D) $(-\infty, -9]$

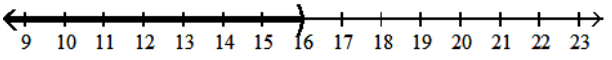


Objective: (1.5) Solve Inequalities

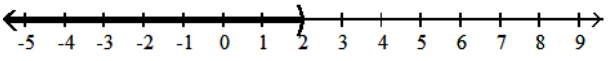
261) $x + 7 < 9$



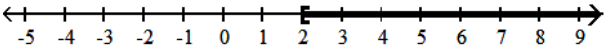
A) $(-\infty, 16)$



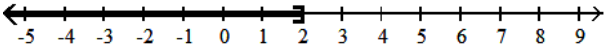
B) $(-\infty, 2)$



C) $(2, \infty)$

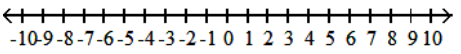


D) $(-\infty, 2]$

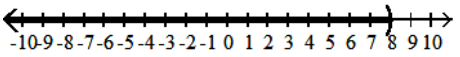


Objective: (1.5) Solve Inequalities

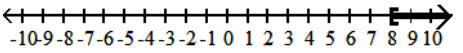
262) $4x + 5 < 37$



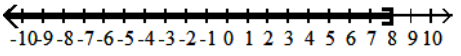
A) $(-\infty, 8)$



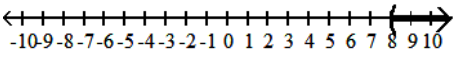
B) $[8, \infty)$



C) $(-\infty, 8]$

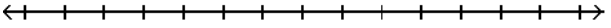


D) $(8, \infty)$

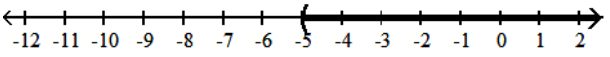


Objective: (1.5) Solve Inequalities

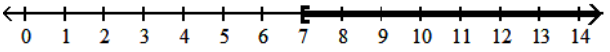
263) $7x - 6 > 6x + 1$



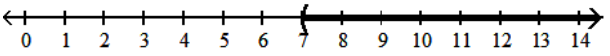
A) $(-5, \infty)$



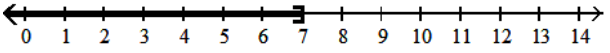
B) $[7, \infty)$



C) $(7, \infty)$

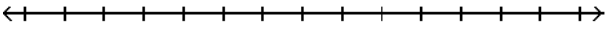


D) $(-\infty, 7]$

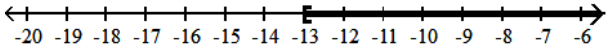


Objective: (1.5) Solve Inequalities

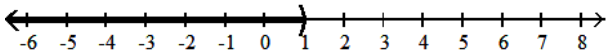
264) $-3x - 7 \leq -4x - 6$



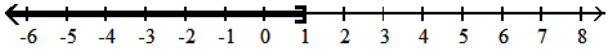
A) $[-13, \infty)$



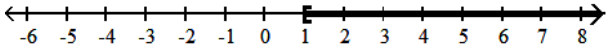
B) $(-\infty, 1)$



C) $(-\infty, 1]$

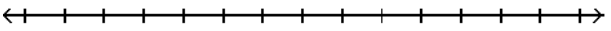


D) $[1, \infty)$

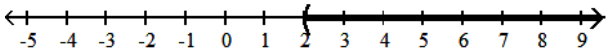


Objective: (1.5) Solve Inequalities

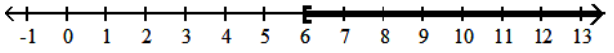
265) $-2x - 2 \geq -3x + 4$



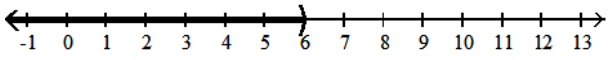
A) $(2, \infty)$



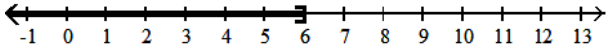
B) $[6, \infty)$



C) $(-\infty, 6)$

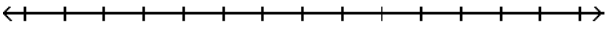


D) $(-\infty, 6]$

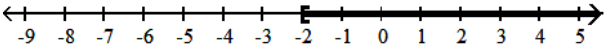


Objective: (1.5) Solve Inequalities

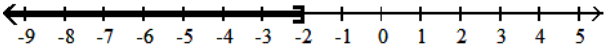
266) $-2x + 5 > -3x + 3$



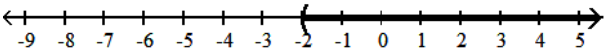
A) $[-2, \infty)$



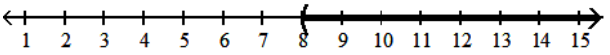
B) $(-\infty, -2]$



C) $(-2, \infty)$

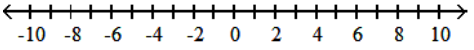


D) $(8, \infty)$

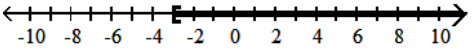


Objective: (1.5) Solve Inequalities

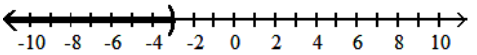
267) $5 - 3(1 - x) \leq -7$



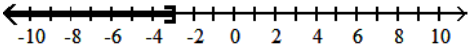
A) $[-3, \infty)$



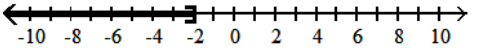
B) $(-\infty, -3)$



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

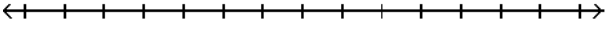


D) $(-\infty, -2]$

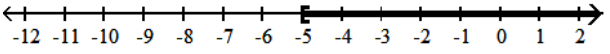


Objective: (1.5) Solve Inequalities

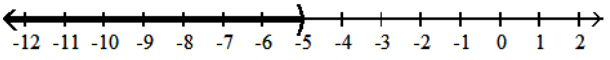
268) $-9x - 6 \leq -3(2x - 3)$



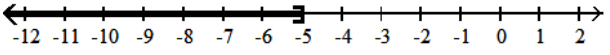
A) $[-5, \infty)$



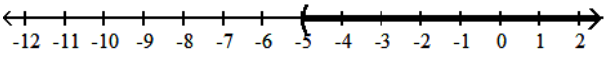
B) $(-\infty, -5)$



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

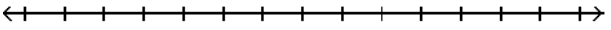


D) $[-5, \infty)$

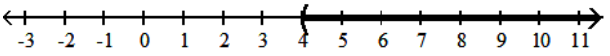


Objective: (1.5) Solve Inequalities

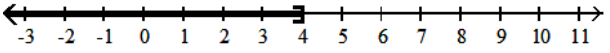
269) $-3(3x + 11) < -12x - 21$



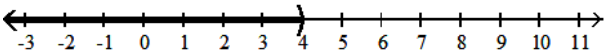
A) $(4, \infty)$



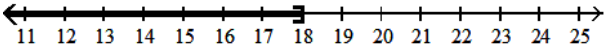
B) $(-\infty, 4]$



C) $(-\infty, 4)$

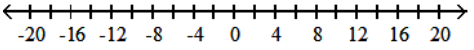


D) $(-\infty, 18]$

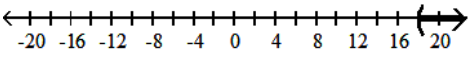


Objective: (1.5) Solve Inequalities

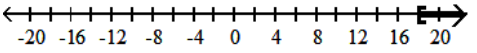
270) $\frac{x}{3} \geq 5 + \frac{x}{18}$



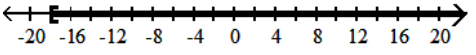
A) $(18, \infty)$



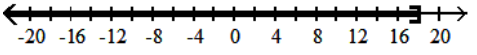
B) $[18, \infty)$



C) $[-18, \infty)$

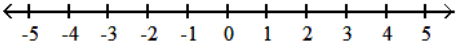


D) $(-\infty, 18]$

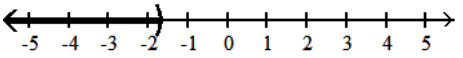


Objective: (1.5) Solve Inequalities

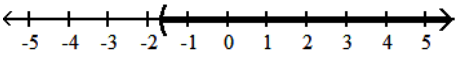
271) $(3x + 5)^{-1} < 0$



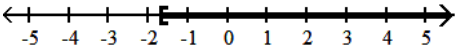
A) $(-\infty, -\frac{5}{3})$



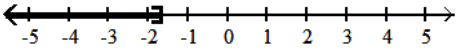
B) $(-\frac{5}{3}, \infty)$



C) $[-\frac{5}{3}, \infty)$

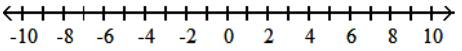


D) $(-\infty, -\frac{5}{3}]$



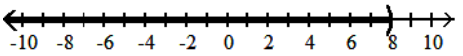
Objective: (1.5) Solve Inequalities

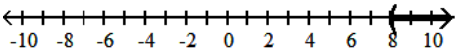
272) $\left(4 - \frac{1}{2}x\right)^{-1/2} > 0$



A) $(-\infty, 8)$

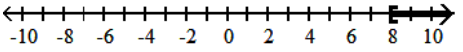
B) $(8, \infty)$

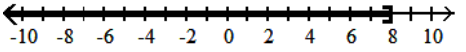




C) $[8, \infty)$

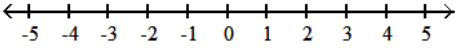
D) $(-\infty, 8]$





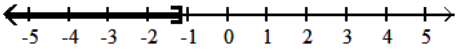
Objective: (1.5) Solve Inequalities

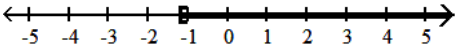
273) $x(4x - 6) \leq (2x + 6)^2$



A) $(-\infty, -\frac{6}{5}]$

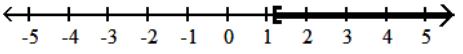
B) $[-\frac{6}{5}, \infty)$

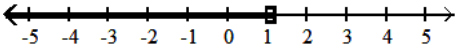




C) $[\frac{6}{5}, \infty)$

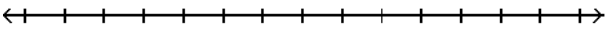
D) $(-\infty, -\frac{6}{5}]$



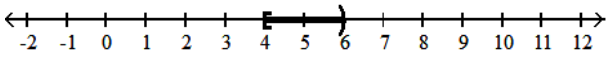


Objective: (1.5) Solve Inequalities

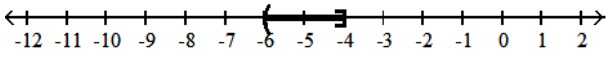
274) $8 < 2x \leq 12$



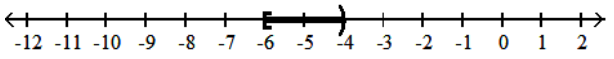
A) [4, 6)



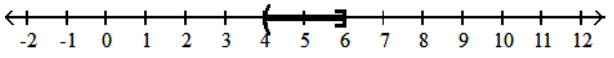
B) (-6, -4]



C) [-6, -4)

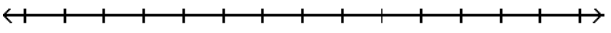


D) (4, 6]

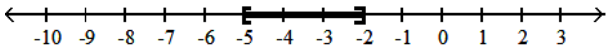


Objective: (1.5) Solve Combined Inequalities

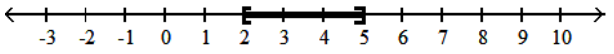
275) $1 \leq 3x - 5 \leq 10$



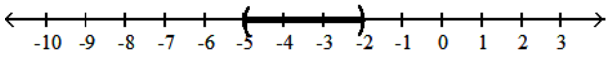
A) [-5, -2]



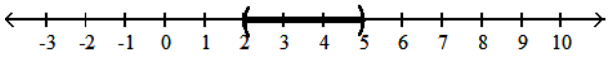
B) [2, 5]



C) (-5, -2)

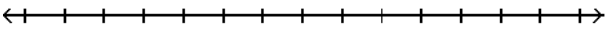


D) (2, 5)

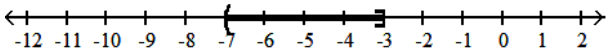


Objective: (1.5) Solve Combined Inequalities

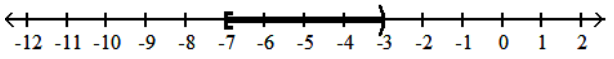
276) $-19 \leq -2x - 5 < -11$



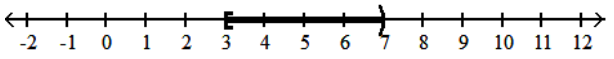
A) $(-7, -3]$



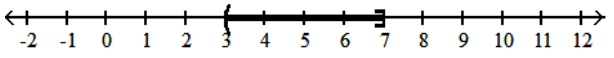
B) $[-7, -3)$



C) $[3, 7)$

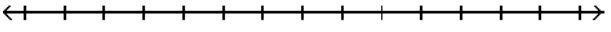


D) $(3, 7]$

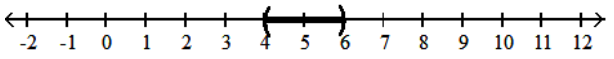


Objective: (1.5) Solve Combined Inequalities

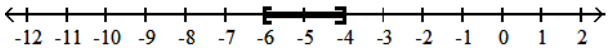
277) $-15 \leq -2x - 3 \leq -11$



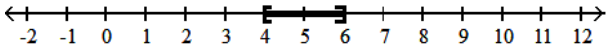
A) $(4, 6)$



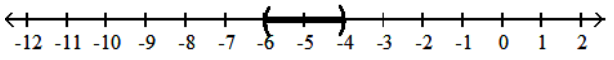
B) $[-6, -4]$



C) $[4, 6]$

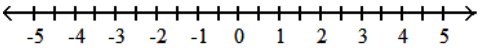


D) $(-6, -4)$

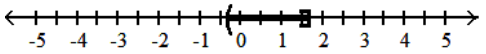


Objective: (1.5) Solve Combined Inequalities

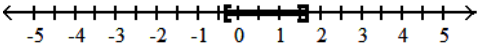
278) $0 \le \frac{3x + 1}{2} < 3$



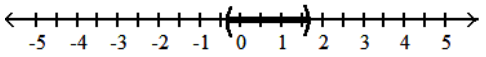
A) $(-\frac{1}{3}, \frac{5}{3}]$



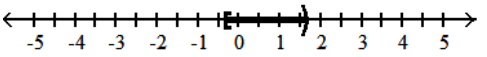
B) $[-\frac{1}{3}, \frac{5}{3}]$



C) $(-\frac{1}{3}, \frac{5}{3})$

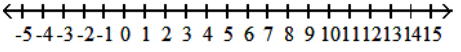


D) $[-\frac{1}{3}, \frac{5}{3})$

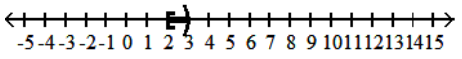


Objective: (1.5) Solve Combined Inequalities

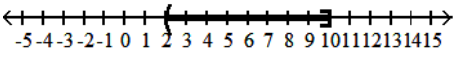
279) $7 \le \frac{5}{2}x + 2 < 27$



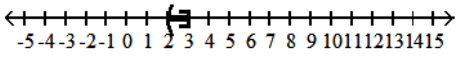
A) [2, 3)



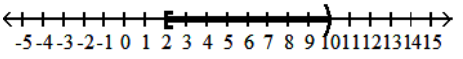
B) (2, 10]



C) (2, 3]



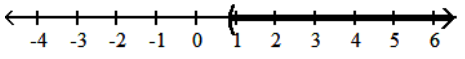
D) [2, 10)



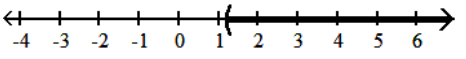
Objective: (1.5) Solve Combined Inequalities

280) $0 < \frac{3}{x} < \frac{5}{2}$

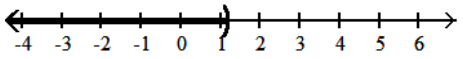
A) $(\frac{5}{6}, \infty)$



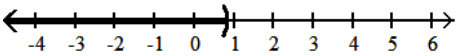
B) $(\frac{6}{5}, \infty)$



C) $(-\infty, \frac{6}{5})$

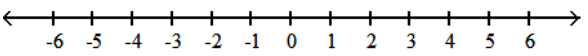


D) $(-\infty, \frac{5}{6})$

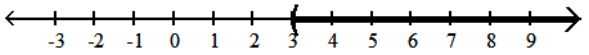


Objective: (1.5) Solve Combined Inequalities

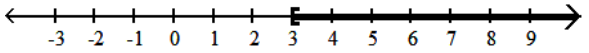
281) $0 < (2x - 4)^{-1} < \frac{1}{2}$



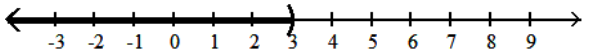
A) $(3, \infty)$



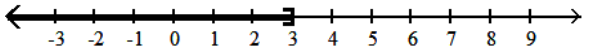
B) $[3, \infty)$



C) $(-\infty, 3)$



D) $(-\infty, 3]$



Objective: (1.5) Solve Combined Inequalities

Find a and b.

282) If $-4 < x < -1$, then $a < \frac{2}{3}x < b$.

A) $a = \frac{8}{3}, b = -\frac{2}{3}$ B) $a = -\frac{8}{3}, b = \frac{2}{3}$ C) $a = -\frac{8}{3}, b = -\frac{2}{3}$ D) $a = \frac{8}{3}, b = \frac{2}{3}$

Objective: (1.5) Solve Combined Inequalities

283) If $0 < 2x < 6$, then $a < x^2 < b$.

A) $a = 0, b = 3$ B) $a = 0, b = 16$ C) $a = 0, b = 9$ D) $a = 0, b = 36$

Objective: (1.5) Solve Combined Inequalities

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the problem.

284) What is the domain of the variable in the expression $\sqrt{4x - 12}$?

Objective: (1.5) Solve Combined Inequalities

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

285) In one city, the local cable TV company charges $1.05 for each pay-per-view movie watched. In addition, each monthly bill contains a basic customer charge of $16.50. If last month's bills ranged from a low of $22.80 to a high of $38.55, over what range did customers watch pay-per-view movies?

A) movies watched varied from 5 to 20 inclusive B) movies watched varied from 7 to 22 inclusive
C) movies watched varied from 6 to 21 inclusive D) movies watched varied from 5 to 22 inclusive

Objective: (1.5) Solve Combined Inequalities

286) During the first five months of the year, Len earned commissions of $3,850, $2,790, $2,450, $2,360, and $3,580. If Len must have average monthly earnings of at least $3,140 in order to qualify for retirement benefits, what must he earn in the sixth month in order to qualify for benefits?

A) at least $3,006 B) at least $3,140 C) at least $3,028 D) at least $3,810

Objective: (1.5) Solve Combined Inequalities

287) A real estate agent agrees to sell an office building according to the following commission schedule: $30,000 plus 30% of the selling price in excess of $700,000. Assuming that the office building will sell at some price between $700,000 and $1,000,000, inclusive, over what range does the agent's commission vary?

A) The commission will vary between $240,000 and $330,000, inclusive.
B) The commission will vary between $30,000 and $120,000, inclusive.
C) The commission will vary between $31,000 and$120,000, inclusive.
D) The commission will vary between $30,000 and $320,000, inclusive.

Objective: (1.5) Solve Combined Inequalities

288) Jim has gotten scores of 82 and 65 on his first two tests. What score must he get on his third test to keep an average of 80 or better?

A) at least 75 B) at least 73.5 C) at least 91 D) at least 93

Objective: (1.5) Solve Combined Inequalities

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

289) In his algebra class, Rob has scores of 79, 85, 81, and 65 on his first four tests. To get a grade of C, the average of the first five tests must be greater than or equal to 70 and less than 80. Solve an inequality to find the range of scores that Rob can earn on the fifth test to get a C.

Objective: (1.5) Solve Combined Inequalities

290) Marianne is planning a shopping trip to buy birthday gifts for her son. She estimates that the total price of the items she plans to purchase will be between $350 and $400 inclusive. If sales are taxed at a rate of 8.375% in her area, what is the range of the amount of sales tax she should expect to pay on her purchases? If Marianne's budget for the shopping trip is $425, will she necessarily be able to buy all the gifts that she has planned?

Objective: (1.5) Solve Combined Inequalities

291) At Bargain Car Rental, the cost of renting an economy car for one day is $19.95 plus 20 cents per mile. At Best Deal Car Rental, the cost of renting a similar car for one day is $24.95 plus 15 cents per mile. Solve the inequality $24.95 + 0.15x < 19.95 + 0.20x$ to find the range of miles driven such that Best Deal is a better deal than Bargain.

Objective: (1.5) Solve Combined Inequalities

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

Solve the equation.

292) $|x| = 8$

A) {8} B) {-8, 8} C) {64} D) {-8}

Objective: (1.6) Solve Equations Involving Absolute Value

293) $|x| = -1$

A) {1, -1} B) {-1} C) {1} D) no solution

Objective: (1.6) Solve Equations Involving Absolute Value

294) $|x| - 12 = -13$

A) {1} B) {-1} C) {1, -1} D) no solution

Objective: (1.6) Solve Equations Involving Absolute Value

295) $|x + 1| = 7$

A) {-8, 6} B) {-6} C) {8, 6} D) no solution

Objective: (1.6) Solve Equations Involving Absolute Value

296) $|3x + 8| = 9$

A) $\{-\frac{1}{3}, \frac{17}{3}\}$ B) $\{\frac{1}{8}, -\frac{17}{8}\}$ C) $\{\frac{1}{3}, -\frac{17}{3}\}$ D) no solution

Objective: (1.6) Solve Equations Involving Absolute Value

297) $|x + 4| = 0$

A) {4, -4} B) {4} C) {-4} D) no solution

Objective: (1.6) Solve Equations Involving Absolute Value

298) $3|x - 3| = 18$

A) {3} B) {9, -3} C) {3, -9} D) no solution

Objective: (1.6) Solve Equations Involving Absolute Value

299) $|7x + 5| + 3 = 5$

A) $\{-\frac{3}{5}, -\frac{7}{5}\}$ B) $\{-\frac{3}{7}, -1\}$ C) $\{\frac{3}{7}, 1\}$ D) no solution

Objective: (1.6) Solve Equations Involving Absolute Value

300) $\left|\frac{11x + 33}{3}\right| = 11$

A) {6, 0} B) {-6, 6} C) {-6, 0} D) no solution

Objective: (1.6) Solve Equations Involving Absolute Value

301) $|2(x + 1) + 4| = 10$

A) {-8, 0} B) {-8, 2} C) {-6, 4} D) {-6, 0}

Objective: (1.6) Solve Equations Involving Absolute Value

302) $|x^2 + 2x| = 0$

A) {2, 0} B) {2, 0, -2} C) {0, -2} D) no solution

Objective: (1.6) Solve Equations Involving Absolute Value

303) $|x^2 - 4x - 4| = 8$

A) {-2, 2, -6} B) {2, 6} C) {-2, 2, 6} D) {-2, 2}

Objective: (1.6) Solve Equations Involving Absolute Value

304) $|2x^2 - x - 1| = 3$

A) $\{-\frac{1 - \sqrt{33}}{4}, -\frac{1 + \sqrt{33}}{4}\}$ B) $\{\frac{1 - \sqrt{33}}{4}, \frac{1 + \sqrt{33}}{4}\}$

C) $\{\frac{1 - \sqrt{33}}{4}, -\frac{1 + \sqrt{33}}{4}\}$ D) no solution

Objective: (1.6) Solve Equations Involving Absolute Value

305) $|x^2 - 4x + 4| = 2$

A) $\{2 - \sqrt{2}\}$ B) $\{2 - \sqrt{2}, 2 + \sqrt{2}\}$ C) $\{2 + \sqrt{2}\}$ D) no solution

Objective: (1.6) Solve Equations Involving Absolute Value

306) $|7x - 6| = |x - 4|$

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

Objective: (1.6) Solve Equations Involving Absolute Value

307) $\left|\frac{3x + 12}{4}\right| = 3$

A) $\{8, 0\}$ B) $\{-8, 8\}$ C) $\{-8, 0\}$ D) $\emptyset$

Objective: (1.6) Solve Equations Involving Absolute Value

Solve the inequality. Express your answer using interval notation.

308) $|x| < 9$

A) $(-9, 9)$ B) $(-\infty, -9)$ and $(9, \infty)$ C) $(-\infty, -9)$ or $(9, \infty)$ D) $[0, 9]$

Objective: (1.6) Solve Inequalities Involving Absolute Value

309) $|x| < -2$

A) $\{-2\}$ B) $(-2, 2)$ C) $(-\infty, \infty)$ D) no solution

Objective: (1.6) Solve Inequalities Involving Absolute Value

310) $|x| > -2$

A) $\{2\}$ B) $(-2, 2)$ C) $(-\infty, \infty)$ D) no solution

Objective: (1.6) Solve Inequalities Involving Absolute Value

311) $|3x + 3| + 9 > 4$

A) $(-\infty, -\frac{8}{3})$ or $(\frac{2}{3}, \infty)$ B) $(-\frac{8}{3}, \frac{2}{3})$ C) $(-\infty, \infty)$ D) no solution

Objective: (1.6) Solve Inequalities Involving Absolute Value

312) $|x - 8| - 5 \leq 0$

A) $(-\infty, 3)$ or $(13, \infty)$ B) $[-3, 0]$ C) $[3, 13]$ D) no solution

Objective: (1.6) Solve Inequalities Involving Absolute Value

313) $|7x - 7| - 6 < 0$

A) $(-\infty, \frac{1}{7})$ B) $(\frac{1}{7}, \frac{13}{7})$ C) $(-\infty, \frac{1}{7})$ or $(\frac{13}{7}, \infty)$ D) no solution

Objective: (1.6) Solve Inequalities Involving Absolute Value

314) $|5x - 1| \geq 5$

A) $(-\infty, -\frac{4}{5})$ or $(\frac{6}{5}, \infty)$ B) $(-\frac{4}{5}, \frac{6}{5})$ C) $(-\infty, -\frac{4}{5}]$ or $[\frac{6}{5}, \infty)$ D) $[-\frac{4}{5}, \frac{6}{5}]$

Objective: (1.6) Solve Inequalities Involving Absolute Value

315) $|5x + 2| > 3$

A) $(-\infty, -1)$ or $(\frac{1}{5}, \infty)$ B) $[-1, \frac{1}{5}]$ C) $(-1, \frac{1}{5})$ D) $(-\infty, -1]$ or $[\frac{1}{5}, \infty)$

Objective: (1.6) Solve Inequalities Involving Absolute Value

316) $|5 - 7x| > 9$

A) $(-\frac{4}{7}, \infty)$ or $(2, \infty)$ B) $(-\infty, -\frac{4}{7})$ or $(\frac{4}{7}, \infty)$ C) $(-\frac{4}{7}, 2)$ D) $(-\infty, -\frac{4}{7})$ or $(2, \infty)$

Objective: (1.6) Solve Inequalities Involving Absolute Value

317) $|7x + 4| + |-5| \leq 8$

A) $(-\infty, -1]$ or $[-\frac{1}{7}, \infty)$ B) $[\frac{1}{7}, 1]$ C) $(-\infty, \frac{1}{7}]$ or $[1, \infty)$ D) $[-1, -\frac{1}{7}]$

Objective: (1.6) Solve Inequalities Involving Absolute Value

318) $|x - 1| < 0$

A) $(-\infty, 1)$ B) $(-1, 1)$ C) $(-1, \infty)$ D) no solution

Objective: (1.6) Solve Inequalities Involving Absolute Value

319) $|x + 8| \leq 0$

A) $(-\infty, -8)$ B) $\{-8\}$ C) $\{8\}$ D) no solution

Objective: (1.6) Solve Inequalities Involving Absolute Value

Solve the inequality. Express your answer in set notation.

320) $x^2 < 4$

A) $\{x \mid x < 2\}$ B) $\{x \mid -2 \leq x \leq 2\}$
C) $\{x \mid -2 < x < 2\}$ D) $\{x \mid x < -2 \text{ or } x > 2\}$

Objective: (1.6) Solve Inequalities Involving Absolute Value

321) $x^2 \geq 64$

A) $\{x \mid x < -8 \text{ or } x > 8\}$ B) $\{x \mid x \leq -8 \text{ or } x \geq 8\}$
C) $\{x \mid -8 \leq x \leq 8\}$ D) $\{x \mid x < -8 \text{ or } x \geq 8\}$

Objective: (1.6) Solve Inequalities Involving Absolute Value

322) $x^2 > 1$

A) $\{x \mid -1 \leq x \leq 1\}$ B) $\{x \mid x < -1 \text{ or } x > 1\}$
C) $\{x \mid x \leq -1 \text{ or } x \geq 1\}$ D) $\{x \mid x < -1 \text{ or } x \geq 1\}$

Objective: (1.6) Solve Inequalities Involving Absolute Value

323) $x^2 \leq 49$

A) $\{x \mid x \leq -7 \text{ or } x \geq 7\}$ B) $\{x \mid -7 < x < 7\}$ C) $\{x \mid -7 \leq x \leq 7\}$ D) $\{x \mid x \leq 7\}$

Objective: (1.6) Solve Inequalities Involving Absolute Value

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the problem.

324) Express that x differs from -7 by more than 3 as an inequality involving absolute value. Solve for x.

Objective: (1.6) Solve Inequalities Involving Absolute Value

325) A landscaping company sells 40-pound bags of top soil. The actual weight x of a bag, however, may differ from the advertised weight by as much as 0.75 pound. Write an inequality involving absolute value that expresses the relationship between the actual weight x of a bag and 40 pounds. Over what range may the weight of a 40-pound bag of to soil vary?

Objective: (1.6) Solve Inequalities Involving Absolute Value

326) Chi is assigned to construct a triangle with the measure b of the base and the measure h of the height differing by no more than 0.2 centimeters. Express the relationship between b and h as an inequality involving absolute value.

Objective: (1.6) Solve Inequalities Involving Absolute Value

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

Find a and b.

327) If $|x - 3| < 4$, then $a < x + 2 < b$.

A) $a = 1, b = 9$ B) $a = -6, b = 2$ C) $a = -2, b = 6$ D) $a = -1, b = 7$

Objective: (1.6) Solve Inequalities Involving Absolute Value

328) If $|x + 1| \le 2$, then $a \le \frac{1}{x + 5} \le b$.

A) $a = \frac{1}{8}, b = \frac{1}{6}$ B) $a = \frac{1}{6}, b = \frac{1}{2}$ C) $a = \frac{1}{6}, b = \frac{1}{8}$ D) $a = \frac{1}{2}, b = \frac{1}{6}$

Objective: (1.6) Solve Inequalities Involving Absolute Value

Translate the sentence into a mathematical equation. Be sure to identify the meaning of all symbols.

329) The surface area of a sphere is 4π times the square of the radius.

A) If S represents the surface area and r the radius, then $S = \pi r^2$.

B) If S represents the surface area and r the radius, then $S = 4\pi r$.

C) If S represents the surface area and r the radius, then $4\pi S = r^2$.

D) If S represents the surface area and r the radius, then $S = 4\pi r^2$.

Objective: (1.7) Translate Verbal Descriptions into Mathematical Expressions

330) The volume of a right prism is the area of the base times the height of the prism.

A) If V represents the volume, B the area of the base, and h the height, then $V = \frac{B}{h}$.

B) If V represents the volume, B the area of the base, and h the height, then $V = \frac{1}{2}Bh$.

C) If V represents the volume, B the area of the base, and h the height, then $V = Bh$.

D) If V represents the volume, B the area of the base, and h the height, then $V = B + h$.

Objective: (1.7) Translate Verbal Descriptions into Mathematical Expressions

331) Speed is measured by distance divided by time.

A) If S represents speed, d distance, and t time, then $d = \frac{S}{t}$.

B) If S represents speed, d distance, and t time, then $S = \frac{t}{d}$.

C) If S represents speed, d distance, and t time, then $S = \frac{d}{t}$.

D) If S represents speed, d distance, and t time, then $t = \frac{S}{d}$.

Objective: (1.7) Translate Verbal Descriptions into Mathematical Expressions

332) Momentum is the product of the mass of an object and its velocity.

A) If M represents momentum, m mass, and v velocity, then $M = \frac{1}{2}mv$.

B) If M represents momentum, m mass, and v velocity, then $M = m + v$.

C) If M represents momentum, m mass, and v velocity, then $M = \frac{m}{v}$.

D) If M represents momentum, m mass, and v velocity, then $M = mv$.

Objective: (1.7) Translate Verbal Descriptions into Mathematical Expressions

333) The force of gravity between two objects is the gravitational constant times the product of their masses divided by the square of the distance between them.

A) If F is the force of gravity, G the gravitational constant, m_1 the mass of one object, m_2 the mass of the second, and d the distance between them, then $F = G\frac{m_1 m_2}{d}$.

B) If F is the force of gravity, G the gravitational constant, m_1 the mass of one object, m_2 the mass of the second, and d the distance between them, then $F = G\frac{m_1 + m_2}{d^2}$.

C) If F is the force of gravity, G the gravitational constant, m_1 the mass of one object, m_2 the mass of the second, and d the distance between them, then $F = G\frac{m_1 m_2}{d^2}$.

D) If F is the force of gravity, G the gravitational constant, m_1 the mass of one object, m_2 the mass of the second, and d the distance between them, then $FG = \frac{m_1 m_2}{d^2}$.

Objective: (1.7) Translate Verbal Descriptions into Mathematical Expressions

334) The total cost of producing refrigerators in one production line is \$5,000 plus \$500 per unit produced.

A) If C is the total cost and x is the number of units produced, then $C = 5{,}000x + 500$.

B) If C is the total cost and x is the number of units produced, then $C = \frac{5{,}000}{500x}$.

C) If C is the total cost and x is the number of units produced, then $C = 5{,}000 + 500x$.

D) If C is the total cost and x is the number of units produced, then $C = (5{,}000 + 500)x$.

Objective: (1.7) Translate Verbal Descriptions into Mathematical Expressions

335) The profit derived from the sale of x video cameras is $350 per unit less the sum of $2,000 costs plus $150 per unit.
A) If P is profit and x the units sold, then P = 350x + 2,000 - 150x or P = 200x + 2,000.
B) If P is profit and x the units sold, then P = 350x - (2,000 - 150x) or P = 500x - 2,000.
C) If P is profit and x the units sold, then P = 350x - (2,000 + 150x) or P = 200x - 2,000.
D) If P is profit and x the units sold, then $P = \frac{350}{x} - (2{,}000 + \frac{150}{x})$ or $P = \frac{200}{x} - 2{,}000$.

Objective: (1.7) Translate Verbal Descriptions into Mathematical Expressions

Solve the problem.

336) Don James wants to invest $50,000 to earn $5,820 per year. He can invest in B-rated bonds paying 15% per year or in a Certificate of Deposit (CD) paying 8% per year. How much money should be invested in each to realize exactly $5,820 in interest per year?
A) $24,000 in B-rated bonds and $26,000 in a CD
B) $26,000 in B-rated bonds and $24,000 in a CD
C) $27,000 in B-rated bonds and $23,000 in a CD
D) $23,000 in B-rated bonds and $27,000 in a CD

Objective: (1.7) Solve Interest Problems

337) A bank loaned out $56,000, part of it at the rate of 13% per year and the rest at a rate of 8% per year. If the interest received was $5,730, how much was loaned at 13%?
A) $31,000 B) $26,000 C) $30,000 D) $25,000

Objective: (1.7) Solve Interest Problems

338) A loan officer at a bank has $100,000 to lend and is required to obtain an average return of 13% per year. If he can lend at the rate of 14% or the rate of 11%, how much can he lend at the 11% rate and still meet his required return?
A) $7,142.86 B) $900,000.00 C) $33,333.33 D) $4,000.00

Objective: (1.7) Solve Interest Problems

339) A college student earned $7,700 during summer vacation working as a waiter in a popular restaurant. The student invested part of the money at 9% and the rest at 8%. If the student received a total of $644 in interest at the end of the year, how much was invested at 9%?
A) $2,800 B) $4,900 C) $962 D) $3,850

Objective: (1.7) Solve Interest Problems

340) Susan purchased some municipal bonds yielding 7% annually and some certificates of deposit yielding 9% annually. If Susan's investment amounts to $19,000 and the annual income is $1590, how much money is invested in bonds and how much is invested in certificates of deposit?
A) $13,000 in bonds; $6000 in certificates of deposit
B) $13,500 in bonds; $5500 in certificates of deposit
C) $5500 in bonds; $13,500 in certificates of deposit
D) $6000 in bonds; $13,000 in certificates of deposit

Objective: (1.7) Solve Interest Problems

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

341) Martin purchased some municipal bonds yielding 8% annually and some certificates of deposit yielding 11% annually. If Martin's investment amounts to $23,000 and the annual income is $2230, how much money is invested in bonds and how much is invested in certificates of deposit?

Objective: (1.7) Solve Interest Problems

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

342) Kevin invested part of his $10,000 bonus in a certificate of deposit that paid 6% annual simple interest, and the remainder in a mutual fund that paid 11% annual simple interest. If his total interest for that year was $800, how much did Kevin invest in the mutual fund?

A) $4,000 B) $5,000 C) $6,000 D) $3,000

Objective: (1.7) Solve Interest Problems

343) The manager of a coffee shop has one type of coffee that sells for $8 per pound and another type that sells for $15 per pound. The manager wishes to mix 60 pounds of the $15 coffee to get a mixture that will sell for $11 per pound. How many pounds of the $8 coffee should be used?

A) 80 lb B) 40 lb C) 70 lb D) 140 lb

Objective: (1.7) Solve Mixture Problems

344) The owners of a candy store want to sell, for $6 per pound, a mixture of chocolate-covered raisins, which usually sells for $3 per pound, and chocolate-covered macadamia nuts, which usually sells for $8 per pound. They have a 70-pound barrel of the raisins. How many pounds of the nuts should they mix with the barrel of raisins so that they hit their target value of $6 per pound for the mixture?

A) 112 lb B) 91 lb C) 105 lb D) 98 lb

Objective: (1.7) Solve Mixture Problems

345) The manager of a candy shop sells chocolate covered peanuts for $10 per pound and chocolate covered cashews for $13 per pound. The manager wishes to mix 30 pounds of the cashews to get a cashew-peanut mixture that will sell for $12 per pound. How many pounds of peanuts should be used?

A) 15 lb B) 7.5 lb C) 22.5 lb D) 45 lb

Objective: (1.7) Solve Mixture Problems

346) A chemist needs 140 milliliters of a 62% solution but has only 56% and 84% solutions available. Find how many milliliters of each that should be mixed to get the desired solution.

A) 20 mL of 56%; 120 mL of 84% B) 30 mL of 56%; 110 mL of 84%
C) 120 mL of 56%; 20 mL of 84% D) 110 mL of 56%; 30 mL of 84%

Objective: (1.7) Solve Mixture Problems

347) How much pure acid should be mixed with 3 gallons of a 50% acid solution in order to get an 80% acid solution?

A) 7.5 gal B) 4.5 gal C) 12 gal D) 1.5 gal

Objective: (1.7) Solve Mixture Problems

348) The radiator in a certain make of car needs to contain 60 liters of 40% antifreeze. The radiator now contains 60 liters of 20% antifreeze. How many liters of this solution must be drained and replaced with 100% antifreeze to get the desired strength?

A) 20.0 L B) 24 L C) 30 L D) 15.0 L

Objective: (1.7) Solve Mixture Problems

349) How many gallons of a 30% alcohol solution must be mixed with 60 gallons of a 14% solution to obtain a solution that is 20% alcohol?

A) 7 gal B) 27 gal C) 12 gal D) 36 gal

Objective: (1.7) Solve Mixture Problems

350) How many liters of 80% hydrochloric acid must be mixed with 40% hydrochloric acid to get 15 liters of 65% hydrochloric acid? Write your answer rounded to three decimals.

A) 3.125 L B) 8 L C) 9.375 L D) 4.688 L

Objective: (1.7) Solve Mixture Problems

351) An airplane flies 440 miles with the wind and 330 against the wind in the same length of time. If the speed of the wind is 40, what is the speed of the airplane in still air?

A) 270 mph B) 285 mph C) 120 mph D) 280 mph

Objective: (1.7) Solve Uniform Motion Problems

352) A boat heads upstream a distance of 30 miles on the Mississippi river, whose current is running at 5 miles per hour. If the trip back takes an hour less, what was the speed of the boat in still water? Give the answer rounded to two decimal places, if necessary.

A) 16.58 mph B) 15 mph C) 18.03 mph D) 6 mph

Objective: (1.7) Solve Uniform Motion Problems

353) Two friends decide to meet in Chicago to attend a Cub's baseball game. Rob travels 305 miles in the same time that Carl travels 290 miles. Rob's trip uses more interstate highways and he can average 3 mph more than Carl. What is Rob's average speed?

A) 61 mph B) 58 mph C) 57 mph D) 65 mph

Objective: (1.7) Solve Uniform Motion Problems

354) Gary can hike on level ground 3 miles an hour faster than he can on uphill terrain. Yesterday, he hiked 37 miles, spending 2 hours on level ground and 5 hours on uphill terrain. Find his average speed on level ground.

A) $7\frac{3}{7}$ mph B) $7\frac{6}{7}$ mph C) $4\frac{3}{7}$ mph D) $5\frac{2}{7}$ mph

Objective: (1.7) Solve Uniform Motion Problems

355) Two cars start from the same point and travel in the same direction. If one car is traveling 60 miles per hour and the other car is traveling at 53 miles per hour, how far apart will they be after 9.4 hours?

A) 1,062.2 mi B) 498.2 mi C) 65.8 mi D) 564 mi

Objective: (1.7) Solve Uniform Motion Problems

356) Two trains leave a train station at the same time. One travels east at 10 miles per hour. The other train travels west at 8 miles per hour. In how many hours will the two trains be 153 miles apart?

A) 9 hr B) 4.3 hr C) 8.5 hr D) 17 hr

Objective: (1.7) Solve Uniform Motion Problems

357) Ken and Kara are 30 miles apart on a calm lake paddling toward each other. Ken paddles at 4 miles per hour, while Kara paddles at 7 miles per hour. How long will it take them to meet?

A) $2\frac{1}{4}$ hr B) 10 hr C) 19 hr D) $2\frac{8}{11}$ hr

Objective: (1.7) Solve Uniform Motion Problems

358) A freight train leaves a station traveling at 32 km/h. Two hours later, a passenger train leaves the same station traveling in the same direction at 52 km/h. How long does it takes the passenger train to catch up to the freight train?

A) 4.2 hr B) 2.2 hr C) 3.2 hr D) 5.2 hr

Objective: (1.7) Solve Uniform Motion Problems

359) Five friends drove at an average rate of 60 miles per hour to a weekend retreat. On the way home, they took the same route but averaged 65 miles per hour. What was the distance between home and the retreat if the round trip took 10 hours?

A) 7800 mi B) 624 mi C) $5\frac{1}{5}$ mi D) 312 mi

Objective: (1.7) Solve Uniform Motion Problems

360) During a hurricane evacuation from the east coast of Georgia, a family traveled 270 miles west. For part of the trip, they averaged 70 mph, but as the congestion got bad, they had to slow to 10 mph. If the total time of travel was 6 hours, how many miles did they drive at the reduced speed?

A) 20 mi B) 35 mi C) 25 mi D) 30 mi

Objective: (1.7) Solve Uniform Motion Problems

361) An experienced bank auditor can check a bank's deposits twice as fast as a new auditor. Working together it takes the auditors 18 hours to do the job. How long would it take the experienced auditor working alone?

A) 54 hr B) 27 hr C) 18 hr D) 36 hr

Objective: (1.7) Solve Constant Rate Job Problems

362) BJ can overhaul a boat's diesel inboard engine in 20 hours. His apprentice takes 60 hours to do the same job. How long would it take them working together assuming no gain or loss in efficiency?

A) 80 hr B) 12 hr C) 6 hr D) 15 hr

Objective: (1.7) Solve Constant Rate Job Problems

363) Tracy can wallpaper 5 rooms in a new house in 35 hours. Together with her trainee they can wallpaper the 5 rooms in 19 hours. How long would it take the trainee working by herself to do the job?

A) 75 hr B) 80 hr C) 35 hr D) 40 hr

Objective: (1.7) Solve Constant Rate Job Problems

364) Brandon can paint a fence in 12 hours and Elaine can paint the same fence in 11 hours. How long will they take to paint the fence if they work together?

A) $5\frac{13}{24}$ hr B) $11\frac{1}{2}$ hr C) $5\frac{17}{23}$ hr D) $5\frac{3}{4}$ hr

Objective: (1.7) Solve Constant Rate Job Problems

365) Sue can sew a precut dress in 3 hours. Helen can sew the same dress in 2 hours. If they work together, how long will it take them to complete sewing that dress? Give your answer rounded to one decimal place, if necessary.

A) 5 hr B) 2.5 hr C) 1.2 hr D) 1.8 hr

Objective: (1.7) Solve Constant Rate Job Problems

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

366) Two pumps can fill a water tank in 45 minutes when working together. Alone, the second pump takes 3 times longer than the first to fill the tank. How long does it take the first pump alone to fill the tank?

Objective: (1.7) Solve Constant Rate Job Problems

1) D
2) A
3) A
4) B
5) C
6) C
7) C
8) D
9) C
10) A
11) C
12) B
13) C
14) C
15) A
16) D
17) D
18) A
19) C
20) A
21) D
22) C
23) B
24) B
25) A
26) A
27) A
28) A
29) B
30) B
31) D
32) D
33) C
34) A
35) C
36) A
37) D
38) B
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42) D
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58) C
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62) B
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64) B
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66) D
67) B
68) D
69) B
70) C
71) {-8, 9}
72) C
73) B
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78) A
79) B
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81) B
82) A
83) C
84) D
85) B
86) D
87) $\{2 + \sqrt{3}, 2 - \sqrt{3}\}$
88) D
89) C
90) D
91) A
92) D
93) A
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270) B
271) A
272) A
273) B
274) D
275) B
276) D
277) C
278) D
279) D
280) B
281) A
282) C
283) C
284) $x \geq 3$
285) C
286) D
287) B
288) D
289) $40 \leq x < 90$, where x represents Bob's score on the fifth test
290) $\$29.31 \leq x \leq \$33.50$, where x represents the amount of sales tax; no
291) $x > 100$ mi
292) B
293) D
294) D
295) A
296) C
297) C
298) B
299) B
300) C
301) B
302) C
303) C
304) B
305) B
306) B
307) C
308) A
309) D
310) C
311) C
312) C
313) B
314) C
315) A
316) D
317) D
318) D
319) B
320) C
321) B
322) B
323) C
324) $|x + 7| > 3;\ x < -10$ or $x > -4$
325) $|x - 40| \leq 0.75;\ 39.25 \leq x \leq 40.75$
326) $|b - h| \leq 0.2$
327) A
328) B
329) D
330) C
331) C
332) D
333) C
334) C
335) C
336) B
337) D
338) C
339) A
340) D
341) $10,000 in bonds; $13,000 in certificates of deposit
342) A
343) A
344) C
345) A
346) D
347) B
348) D
349) D
350) C
351) D
352) C
353) A
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360) C
361) B
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363) D
364) C
365) C
366) 60 min