Chapter 1 Supplementary Problems

Write an equation for each statement. Let x be the variable in each equation.

1. 3 times a number is 30
2. 8 less than a number is 12
3. 5 added to 2 times a numbers is 20
4. $\frac{3}{4}$ a number increased by 22 is 30
5. a number divided by 9 plus 15 is 25

Solve each equation. Check your answer.

6. $x - 8 = 17$
7. $x + 3 = 19$
8. $16 - x = 4$
9. $9x = 360$
10. $-x + 5.5 = 8.5$
11. $\frac{2}{3}x = 42$
12. $10 - x = -48$
13. $7\frac{1}{2}x - 3 = 12$
14. $-6.3 + x = -14.2$
15. $\frac{x}{8} = 7$
16. $4x + 3 = 15$
17. $9x - 14 = 31$
18. $16 - 3x = -26$
19. $4x - 12 = 53$
20. $\frac{4}{5}x - 7 = 25$
21. $6x + 3 = -8x - 13$
22. $x - 74 = \frac{3}{8}x + 36$
23. $15x - 9 = -27$
24. $\frac{3}{10}x + 15 = \frac{1}{5}x - 12$
25. $12x - 56 = -4x + 24$

Graph each inequality using a number line.

26. $x > 4$

27. $x \leq 12$

28. $9x > 18$

29. $3x < 21$

30. $8x - 3 \geq 29$

31. $5x + 14 \leq -6$

32. $12x - 1 < 35$

33. $\frac{1}{2}x - \frac{1}{3} \geq \frac{2}{3}$

34. $7 + 6x \leq 43$

35. $-8 + 12x \geq 40$

Find the solution for each equality or inequality. Graph the solution on a number line.

36. $|x| \geq 5$

37. $|x| = 8$

38. $|x + 3| = 7$

39. $|x| < 9$

40. $|x + 4| \leq 1$

41. $|x - 3| > 4$

42. $|x + 6| = 11$

43. $|3x + 6| = 15$

44. $|2x - 4| \leq 12$

45. $|8x - 3| > 5$

46. $|3x + 5| = 22$

47. $|9x + 3| < 15$

Solve each problem.

48. A number subtracted from 64 is 12. What is the number?

49. Four more than 8 times a number is 28. What is the number?

50. Marisa is $3\frac{1}{2}$ years younger than Calvin, who is 24. How old is Marisa?

Chapter 2 Supplementary Problems

Use the vertical line test to determine if the following are graphs of functions. Write *yes* or *no*.

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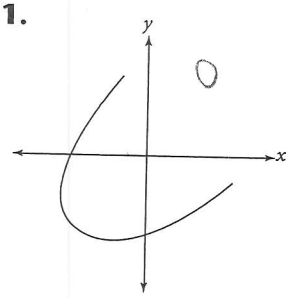

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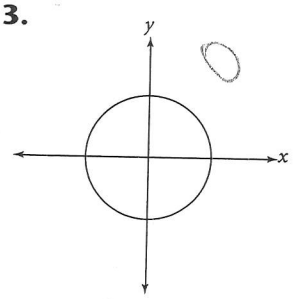

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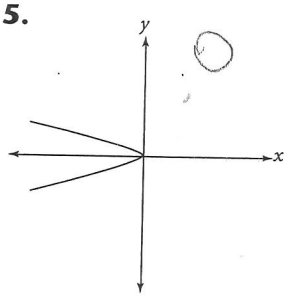

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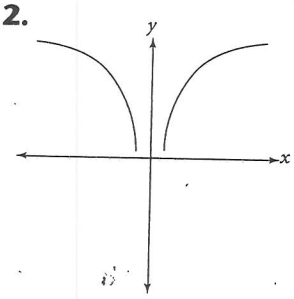

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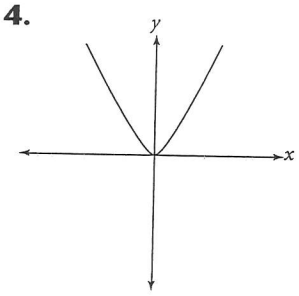


Find the slope of the line that passes through the given points.

6. $(1, 0), (2, 4)$

7. $(3, 2), (-3, 0)$

8. $(8, 5), (4, -4)$

9. $(-2, -5), (-1, 6)$

10. $(12, 4), (10, 0)$

11. $(2, 2), (5, 5)$

12. $(6, -1), (8, -1)$

13. $(0, 0), (10, 10)$

14. $(-9, 2), (-9, -6)$

15. $(3\frac{1}{2}, 7), (6, 5\frac{1}{2})$

Given m and b, write the equation of the line.

16. $m = 3, b = -4$

17. $m = 0, b = 12$

18. $m = -3\frac{1}{2}, b = 6$

19. $m = 14, b = 1\frac{7}{8}$

Write the equation of the line passing through the two given points.

20. (1, −5) and (4, −5)

21. (1, −7) and (−3, 1)

22. (0, 4) and (7, 7)

23. (8, −2) and (10, 8)

Write each equation in the form $y = mx + b$. Give the slope, y-intercept, and zero for each.

24. $3y = 6x + 9$

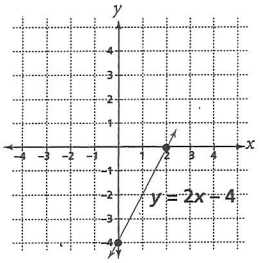
25. $4y = 2x - 12$

26. $-2y = 5x + 18$

27. $4x - 3x = 21$

Give the slope (positive, zero, negative, or no slope), the y-intercept, and the zero or root for each graph.

28.



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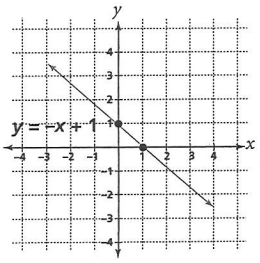

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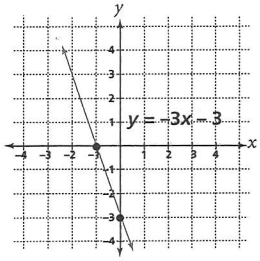

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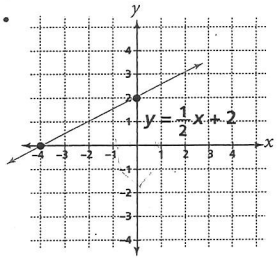

Graph each linear function and label the y-intercept.

32. $f(x) = 4x$

33. $f(x) = x - 3$

34. $f(x) = 2x + 3$

35. $f(x) = -x + 4$

36. $f(x) = \frac{2}{5}x + 1$

Graph the following inequalities.

37. $y \geq 2x - 3$

38. $y < 4x + 2$

39. $y > -3x - 4$

40. $y \leq x - \frac{1}{2}$

Chapter 3 Supplementary Problems

Solve each equation for x and check your answer.

1. $x^2 + 3x = 0$

2. $x^2 - 8x = 0$

3. $x^2 + 12x = 0$

4. $x^2 - \frac{2}{3}x = 0$

5. $x^2 + 4.5x = 0$

6. $2x^2 + 5x = 0$

7. $4x^2 - 3x = 0$

8. $3x^2 + 10x = 0$

9. $5x^2 - 15x = 0$

10. $9x^2 - 6x = 0$

Find the solution for each equation by factoring.

11. $x^2 - x - 6 = 0$

12. $x^2 + 5x + 4 = 0$

13. $x^2 + 2x - 15 = 0$

14. $x^2 - 9x + 8 = 0$

15. $x^2 + x - 30 = 0$

16. $x^2 + 5x - 14 = 0$

17. $x^2 + 8x + 15 = 0$

18. $2x^2 + 9x + 4 = 0$

19. $x^2 - 7x + 10 = 0$

20. $x^2 + x + \frac{1}{4} = 0$

21. $2x^2 + 5x - 12 = 0$

22. $6x^2 - x - 1 = 0$

23. $12x^2 + 7x - 10 = 0$

24. $30x^2 - 8x - 6 = 0$

25. $3x^2 + 5x - 28 = 0$

26. $2x^2 + 5x - 3 = 0$

27. $4x^2 - 12x - 27 = 0$

28. $6x^2 + 16x - 6 = 0$

29. $20x^2 - 3x - 2 = 0$

30. $36x^2 - 3x - 5 = 0$

31. $16x^2 - 62x + 21 = 0$

32. $12x^2 - 7x - 49 = 0$

33. $9x^2 + 21x - 60 = 0$

34. $8x^2 - 34x + 21 = 0$

Find the solution to each equation by completing the square.

35. $x^2 + 5x + 6 = 0$

36. $x^2 - 10x + 21 = 0$

37. $x^2 - 4x - 5 = 0$

38. $x^2 - 2x - 15 = 0$

39. $x^2 + 4x + 1 = 0$

40. $x^2 - 2x - 14 = 0$

41. $x^2 - 3x - 10 = 0$

42. $x^2 + 3x - 1 = 0$

43. $x^2 - 5x + 6 = 0$

44. $x^2 + 4x - 5 = 0$

45. $x^2 - 4x + 4 = 0$

46. $x^2 + 14x + 9 = 0$

47. $x^2 - 4x - 7 = 0$

48. $x^2 - 9x + 2 = 0$

49. $x^2 + 6x + 3 = 0$

50. $x^2 + 3x - 4 = 0$

Use the quadratic formula to solve each equation. You may express your answer in terms of square roots.

51. $x^2 - 6x + 6 = 0$

52. $x^2 + 4x - 2 = 0$

53. $x^2 + 6x - 4 = 0$

54. $2x^2 + 3x - 2 = 0$

55. $3x^2 + 7x + 2 = 0$

56. $x^2 - 2x - 2 = 0$

57. $2x^2 - 3x - 1 = 0$

58. $2x^2 - 5x + 2 = 0$

59. $x^2 - 2x - 4 = 0$

60. $x^2 + 4x + 1 = 0$

Use any method to solve the equations. You may express your answer in terms of i.

61. $x^2 - 3x + 7 = 0$

62. $x^2 - 4x + 8 = 0$

63. $2x^2 + 4x + 10 = 0$

64. $x^2 + 16 = 0$

65. $4x^2 - 5x + 10 = 0$

Chapter 4 Supplementary Problems

Find the values of the function for the given domain values.

1. $f(x) = 2x^2 - x + 3$ $\quad x = -2, -1, 0, 1, 2$

2. $f(x) = -x^2 + 2x - 4$ $\quad x = -2, -1, 0, 1, 2$

3. $f(x) = 10x^2 - 5x + 2$ $\quad x = -1, -\frac{1}{2}, 0, \frac{1}{2}, 1$

4. $f(x) = x^2 + 8x + 16$ $\quad x = -\frac{1}{2}, -\frac{1}{4}, 0, \frac{1}{4}, \frac{1}{2}$

5. $f(x) = -3x^2 - 6x + 1$ $\quad x = -2, -1, 0, 1, 2$

Find seven points for each function, and then sketch the parabola.

6. $f(x) = -2x^2$

7. $f(x) = 3x^2$

8. $f(x) = -\frac{1}{2}x^2$

9. $f(x) = -6x^2$

10. $f(x) = \frac{1}{4}x^2$

Sketch the graph using the function and three points.

11. $f(x) = x^2 - x - 2$

12. $f(x) = x^2 - 5x + 6$

13. $f(x) = x^2 - 5x + 4$

14. $f(x) = x^2 + x - 6$

15. $f(x) = x^2 - 3x - 10$

16. $f(x) = x^2 - x - 12$

17. $f(x) = x^2 + 2x - 3$

18. $f(x) = x^2 - 2x - 8$

19. $f(x) = x^2 - 2x - 3$

20. $f(x) = x^2 - 3x - 4$

Sketch the graphs, using the roots to find the function and the turning point.

21. $x = 3, x = -5$

22. $x = -1, x = -3$

23. $x = 2, x = -6$

24. $x = 7, x = -5$

25. $x = 6, x = 4$

26. $x = -8, x = -3$

27. $x = 4, x = -4$

28. $x = -7, x = -4$

29. $x = 2, x = 8$

30. $x = -1, x = -6$

Find the common solutions to the systems of equations.

31. $f(x) = x^2$ and $y = 4x$

32. $f(x) = 4x^2$ and $y = -2x + 2$

33. $f(x) = x^2$ and $y = -x + 2$

34. $f(x) = x^2 + 3$ and $y = x - 3$

35. $f(x) = x^2 - 1$ and $y = 2x + 2$

36. $f(x) = x^2 + 4$ and $y = -7x + 12$

37. $f(x) = x^2 - x + 1$ and $y = 2x - 1$

38. $f(x) = x^2 + 4x + 5$ and $y = -4x - 2$

39. $f(x) = x^2 - 4x + 1$ and $y = -2$

40. $f(x) = x^2 - 4x - 5$ and $y = 3x - 5$

Find the common solution to the systems of linear equations.

41. $y = 4x + 2$
$y = x - 1$

42. $y = 2x - 2$
$y = 3x$

43. $y = 5x - 3$
$y = 2x + 1$

44. $y = x - 4$
$y = x + 1$

45. $y = -x + 3$
$y = 2x - 6$

46. $y = 3x + 5$
$y = 5x - 3$

47. $2y + 3x = 12$
$-4y + 3x = 0$

48. $5x + 3y = -2$
$5x - 4y = 12$

49. $-2y + 5x = 5$
$2y - 2x = 1$

50. $y + 3x = 5$
$2y + 4x = 4$