CHAPTER 9

Chapter Review

Know it! Note

9-1 Identify Quadratic Functions

Tell whether each function is quadratic. Explain.

1. $y + 2 = 4x + 3x + 12$

2. $\{(-2, 11), (-1, 1), (0, -5), (1, -7), (2, -5)\}$

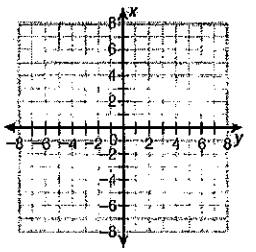
Tell whether the graph of each quadratic function opens upward or downward and whether the parabola has a maximum or a minimum.

3. $y = -x^2 + 4x - 1$

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

5. Graph the function $y = -\frac{3}{4}x^2 - x + 4$ and give the domain and range.

X-values Y-values



9-2 Characteristics of Quadratic Functions

Find the zeros of each function from its graph. Then find its axis of symmetry.

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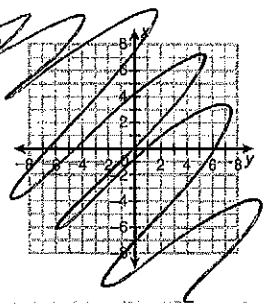

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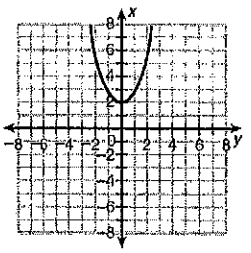

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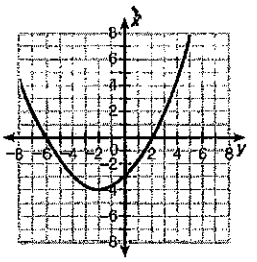


Find the vertex of each parabola.

9. $y = x^2 + 6x - 7$

10. $y = x^2 - 10x + 21$

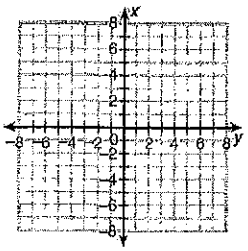
11. $y = 3x^2 + 9x - 12$

Know it! Note

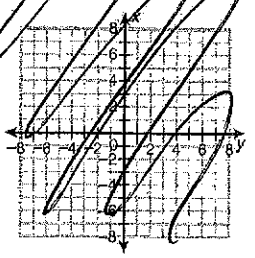
9-3 Graphing Quadratic Functions

Graph each quadratic function.

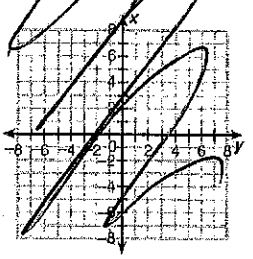
12. $y = 2x^2 + 6x + 1$



13. $y + 3x^2 = \frac{1}{3}x - 1$



14. $y = \frac{1}{4}x^2 - 2x + 4$



9-4 Transforming Quadratic Functions

Compare the graph of each function with the graph of $f(x) = x^2$.

15. $g(x) = x^2 - 5$

16. $g(x) = -\frac{4}{5}x^2$

9-5 Solving Quadratic Equations by Graphing

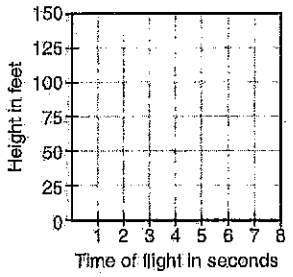
Solve each equation by graphing the related function.

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

18. $2x - 3 = -\frac{1}{8}x^2$

19. $-8x^2 - 4 = 16x$

20. A baseball is thrown upward with an initial velocity of 96 feet per second. The equation $h = -16t^2 + 96t$ represents the height, h, of a baseball after t seconds. Graph the equation. How long will it take the baseball to return to the ground?



9-6 Solving Quadratic Equations by Factoring

Use the Zero Product Property to solve each equation.

21. $(x - 5)(x + 2) = 0$ **22.** $(2x - 5)(4x - 5) = 0$ **23.** $x(x - 5) = 0$

Solve each quadratic equation by factoring.

24. $x^2 + 5x + 6 = 0$ **25.** $2x^2 + 5x = 12$ **26.** $4x^2 = 4x - 1$

9-7 Solving Quadratic Equations by Using Square Roots

Solve using square roots.

27. $2x^2 = 72$ **28.** $0 = 5x^2 - 245$ **29.** $25x^2 - 16 = 0$

30. $4x^2 + 13 = 49$ **31.** $8x^2 + 10 = 42$ **32.** $36x^2 - 59 = -10$

Solve. Round to the nearest hundredth.

33. $84 - 7x^2 = -22$

34. $16x^2 + 144 = 128$

35. $18x^2 + 186 = 94$

9-8 Completing the Square

Complete the square for each expression.

36. $x^2 - 14x + \blacksquare$

37. $x^2 + 6x + \blacksquare$

38. $x^2 - 11x + \blacksquare$

Solve by completing the square.

39. $x^2 + 10x - 11 = 0$

40. $x^2 - 24x + 63 = 0$

41. $2x^2 + 6x = 20$

42. $3x^2 + 4x + 4 = 3$

43. $4x^2 - 12 = 0$

44. $x^2 - 2x = 2$

45. The area of a rectangle is given by $A = x^2 + 4x - 5$. Find the expressions for possible lengths and widths of the rectangle.

9-9 The Quadratic Formula and the Discriminant

Solve using the Quadratic Formula. Round your answer to the nearest hundredth.

46. $2x^2 - 4x - 3 = 0$

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

48. $8x^2 + 10x - 33 = 0$

49. $x^2 + 2x = 1$

50. $2x^2 = 1 - 5x$

51. $x(x - 2) = 4$