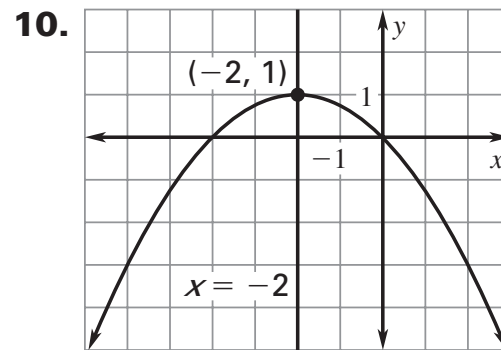
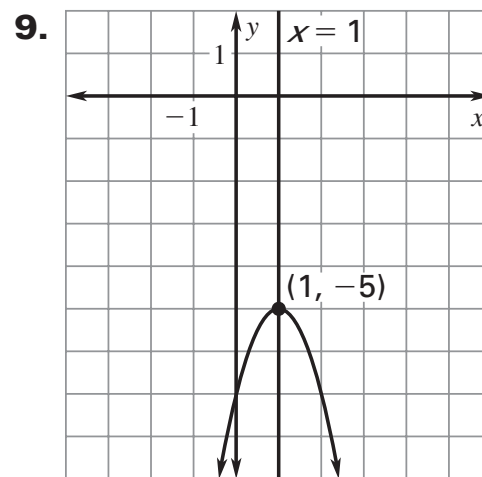
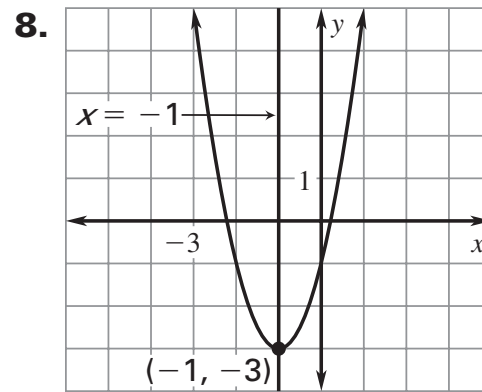
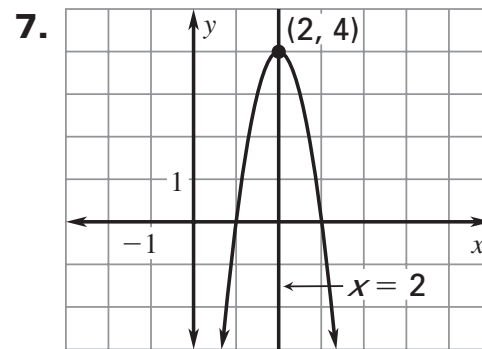
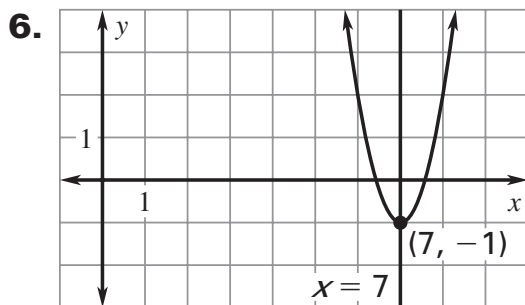
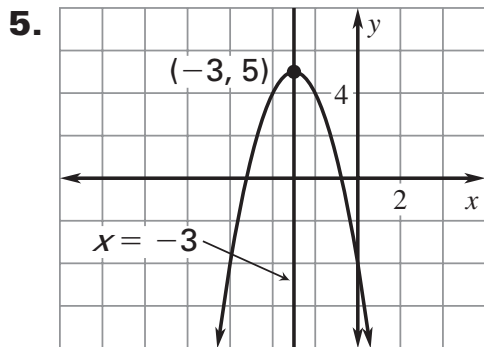
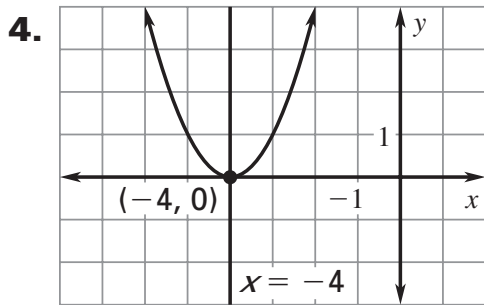
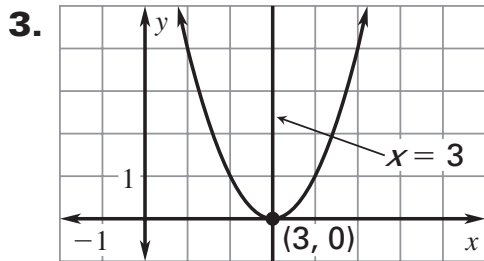


Answers for 4.2

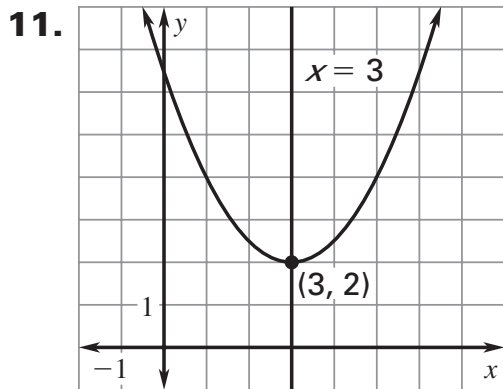
For use with pages 249–251

4.2 Skill Practice

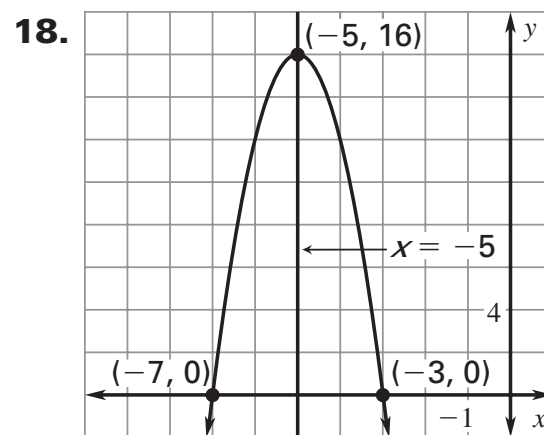
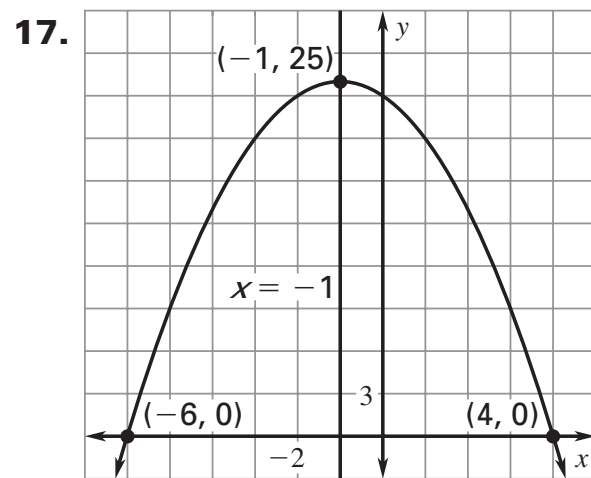
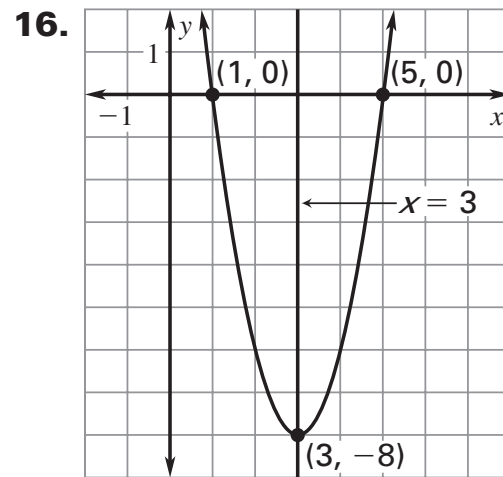
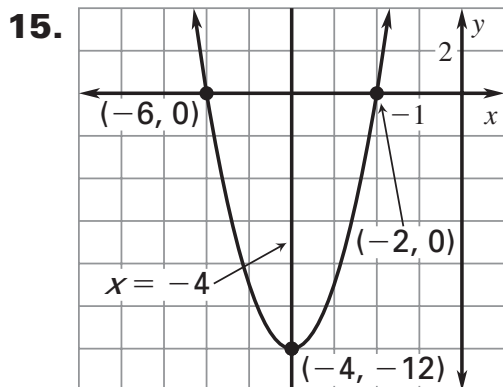
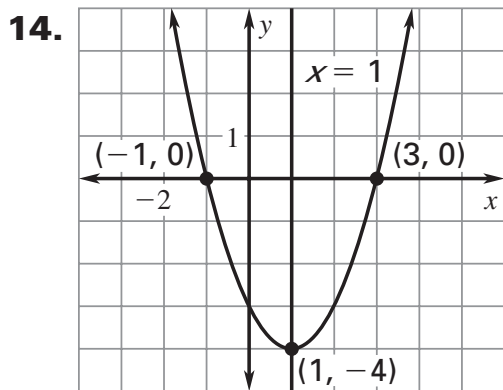
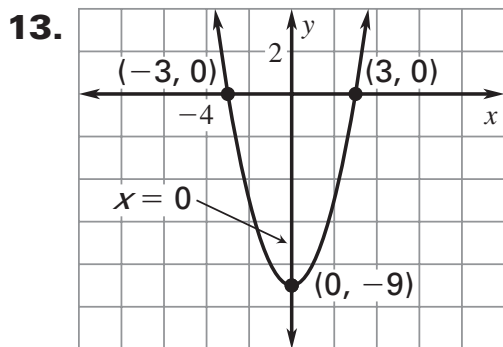
- vertex
- The maximum or minimum is found by substituting the x -coordinate, $\frac{p+q}{2}$, of the vertex into the equation for x .



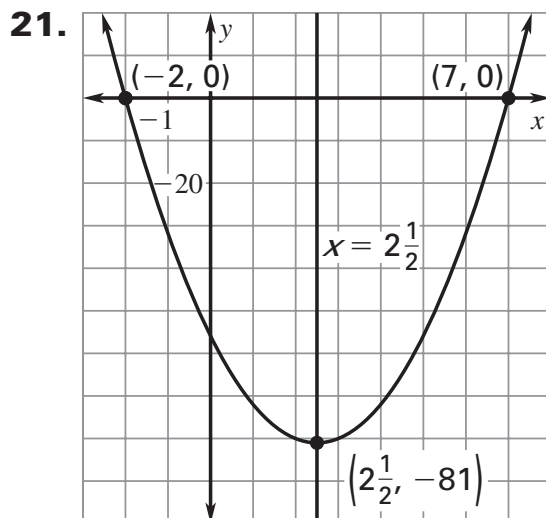
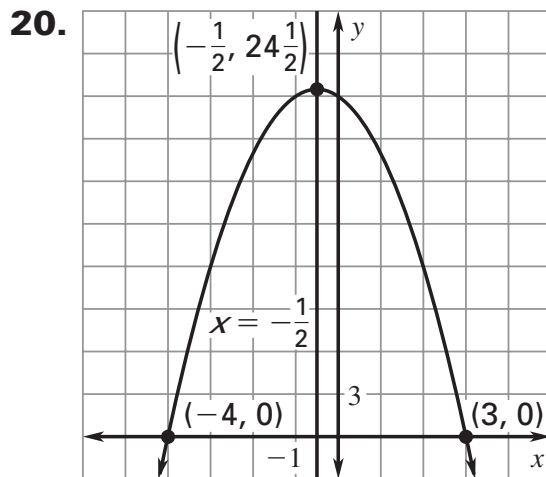
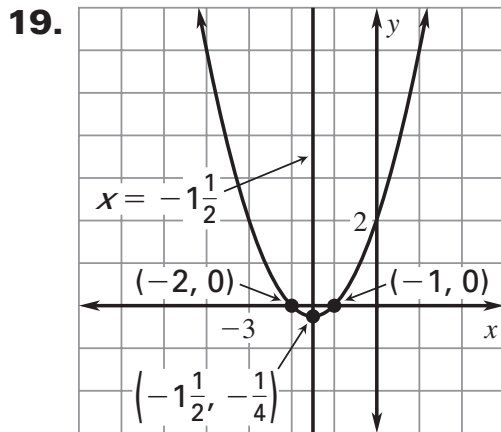
Answers for 4.2 *continued*
For use with pages 249–251



12. B



Answers for 4.2 *continued*
For use with pages 249–251



22. A

23. $p = 2$ and $q = -3$; the x -intercepts of the graph are 2 and -3 .

24. $x^2 + 7x + 12$

25. $x^2 - 2x - 15$

26. $4x^2 - 20x - 24$

27. $-3x^2 + 18x - 24$

28. $x^2 + 10x + 23$

29. $x^2 - 6x + 15$

30. $-x^2 - 12x - 26$

31. $5x^2 + 30x + 41$

32. $12x^2 - 24x + 16$

33. minimum: -4

34. maximum: -12

35. minimum: 130

36. minimum: -243

37. maximum: 729

38. maximum: 243

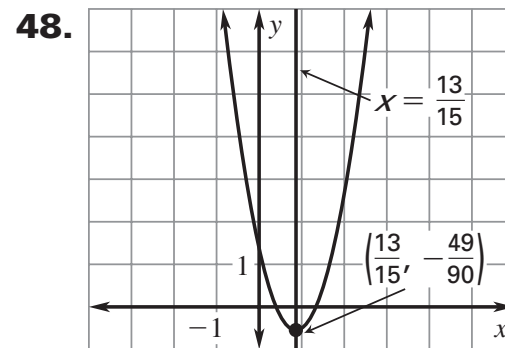
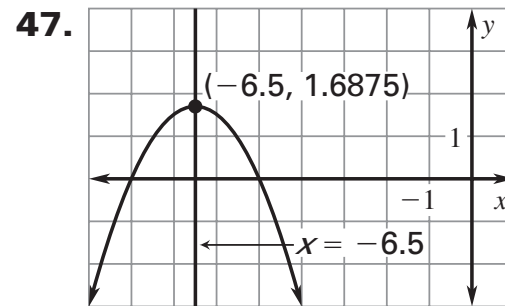
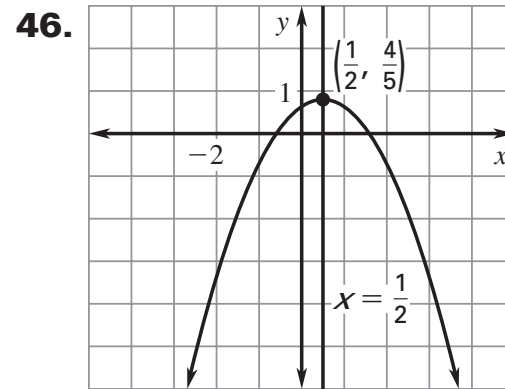
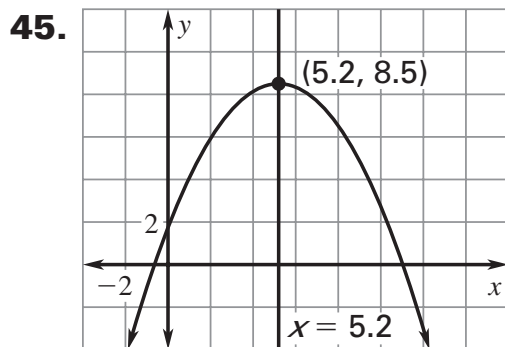
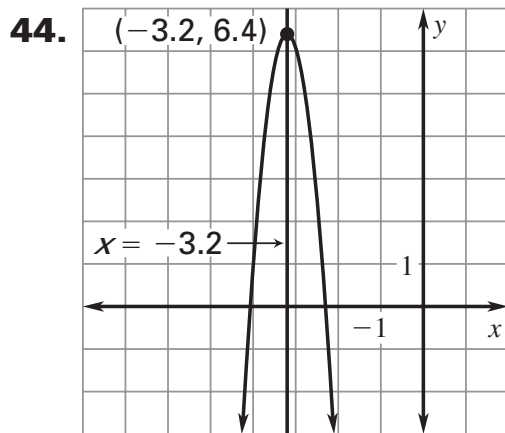
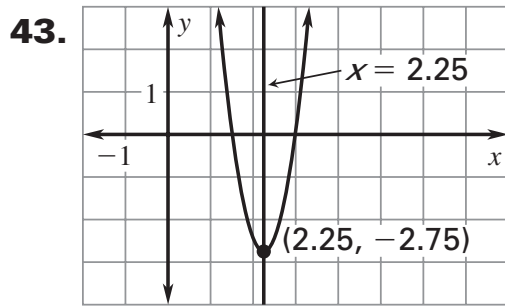
39. minimum: -450

40. minimum: -4.5

41. maximum: 211.25

Answers for 4.2 *continued*
For use with pages 249–251

- 42. a.** The graph opens down and is narrower.
b. The vertex shifted 4 units left.
c. The vertex shifted 4 units up.



49. Sample answer:

$$y = (x - 8)(x + 2),$$

$$y = (x - 4)(x - 2),$$

$$y = (x + 3)(x - 9)$$

Answers for 4.2 *continued*

For use with pages 249–251

$$\begin{aligned} 50. \quad y &= a(x - h)^2 + k \\ &= a(x^2 - 2xh + h^2) + k \\ &= ax^2 - 2ahx + ah^2 + k, \\ x &= -\frac{b}{2a} = \frac{2ah}{2a} = h; \\ y &= a(x - p)(x - q) \\ &= a(x^2 - (p + q)x + pq) \\ &= ax^2 - a(p + q)x + apq, \\ x &= -\frac{b}{2a} = \frac{a(p + q)}{2a} = \frac{p + q}{2} \end{aligned}$$

4.2 Problem Solving

51. 6 ft; about 28 ft

52. about 105 m

53. a. 160 ft

b. about 1.5 ft

54. *Sample answer:* The conventional spring pogo stick reaches a height of 18 inches and the bow spring pogo stick reaches a height of 42 inches; k ; a and h .

55. a. about 14%; about 55.5 cm³

b. about 13.6%; about 44.1 cm³

c. hot-air:

domain: $5.52 < x < 22.6$,
range $0 < y < 55.5$;

hot oil:

domain: $5.35 < x < 21.8$,
range: $0 < y < 44.1$; since
moisture content and popping
volume cannot be negative,
the domain and range must
each be positive numbers.

A positive domain occurs
between the x -intercepts and
the greatest number in the
range occurs at the maximum
point, which is the vertex.

$$56. \quad y = -\frac{5}{1089}(x - 33) + 5;$$

changing the value of a makes
the path wider or narrower,
changing the value of h affects the
horizontal distance, and changing
the value of k affects the vertical
distance of the flight path.

4.2 Mixed Review

57. 5

58. -1.5

59. 0.25

60. -0.6875

61. $-7, 25$

62. $-9, 4.5$

63. 3, 4

64. $-0.8, 2$

$$65. \quad \begin{bmatrix} 0 & 0 \\ 7 & -2 \end{bmatrix}$$

$$66. \quad \begin{bmatrix} 3 & -6 \\ 3 & 33 \end{bmatrix}$$

Answers for 4.2 *continued*

For use with pages 249–251

$$67. \begin{bmatrix} -1 & 8 & -17 \\ -6 & 5 & -16 \end{bmatrix}$$

$$68. \begin{bmatrix} 7 & 30 \\ -11 & -52 \end{bmatrix}$$

$$69. \begin{bmatrix} 12 & 25 \\ -19 & -45 \end{bmatrix}$$

$$70. \begin{bmatrix} 84 & 16 & 68 \\ 48 & 12 & 56 \end{bmatrix}$$