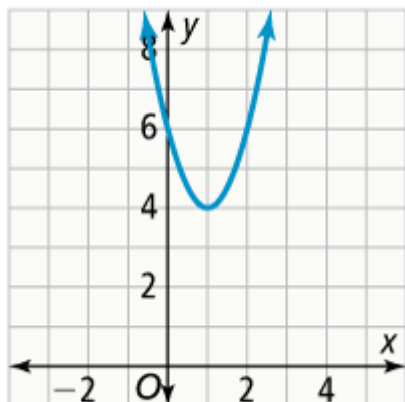


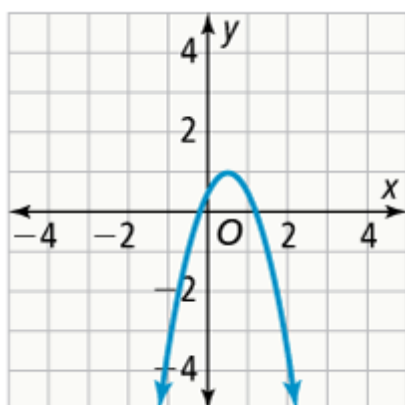
10. The coordinates of the vertex are  $(h, k)$ . From the graph,  $h = 3$  and  $k = -2$ ;  
 $f(x) = (x - 3)^2 - 2$ .
11. No; because  $|a| > 1$ , the graph of this parabola is narrower than the graph  
of the parent function  
 $f(x) = x^2$ .
12. The vertex should be plotted at  $(1, 6)$ , not  $(-1, 6)$ .
13.  $f(x) = 2(x - 1)^2 - 3$
14. a. The graph of  $h$  is a translation 3 units left and 3 units up of the graph of  
 $f(x) = x^2$ .  
b.  $h(x) = (x + 3)^2 + 3$
15.  $(0, 2)$ ;  $x = 0$
16.  $(0, -5)$ ;  $x = 0$
17.  $(0, -1)$ ;  $x = 0$
18.  $(0, 0.5)$ ;  $x = 0$
19.  $(0, -2.25)$ ;  $x = 0$
20.  $(0, 50)$ ;  $x = 0$
21.  $(0, 7)$ ;  $x = 0$
22.  $(1, 0)$ ;  $x = 1$
23.  $(-2, 0)$ ;  $x = -2$
24.  $(6, 0)$ ;  $x = 6$
25.  $(0.5, 0)$ ;  $x = 0.5$
26.  $(4, 0)$ ;  $x = 4$
27.  $f(x) = (x - 2)^2 + 3$
28.  $f(x) = (x + 3)^2 - 1$

29.  $(-1, 4)$ ;  $x = -1$ ; opens upward; The width of the graph is narrower than the width of the graph of  $f(x) = x^2$ .
30.  $(3, -3)$ ;  $x = 3$ ; opens upward; The width of the graph is the as the width of the graph of  $f(x) = x^2$ .
31.  $(5, 4)$ ;  $x = 5$ ; opens downward; The width of the graph is wider than the width of the graph of  $f(x) = x^2$ .
32.  $(-2, -5)$ ;  $x = -2$ ; opens downward. The width of the graph is narrower than the width of the graph of  $f(x) = x^2$ .

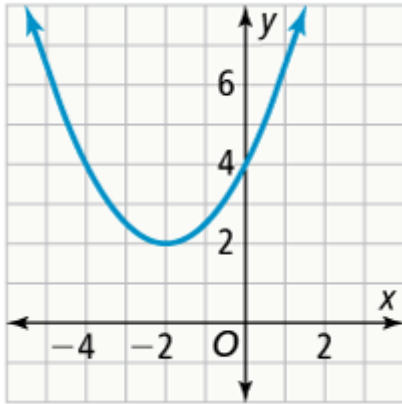
33.



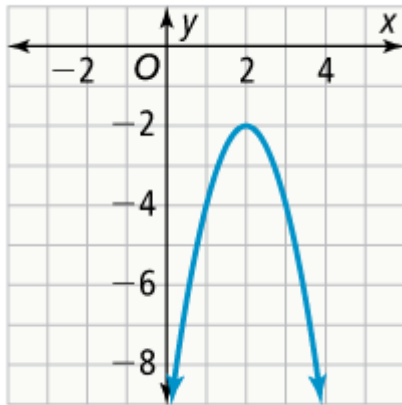
34.



35.



36.



37.  $f(x) = 2(x + 1)^2 - 4$

38.  $f(x) = -3(x - 2)^2 + 5$

39.  $(-1, 42)$

40. a.  $b(x) = a(x - 28.5)^2$ ; The  $x$ -coordinate of the vertex can be determined, but the  $y$ -coordinate of the vertex and the value of  $a$  cannot be determined because only the  $x$ -intercepts are given.

b. Answers may vary. Sample: Suppose  $k = 10$ . Then  $a \approx -0.01231$ . The value of  $k$  represents the maximum height of the ball, the  $x$ -intercepts represent where the ball is on the ground, and the value of  $a$  shows that the arc of the ball opens downward.

**41.** If the player is 2 ft from the net, then the net is located at  $x = 1$ , and the height of the ball when  $x = 1$  is  $f(1) = -(1 - 1)^2 + 8 = 8$ , or 8 ft, so the ball will go over the net. If the player is 4 ft from the net, then she is 2 ft farther from the net and the parabola is translated 2 units to the left. The translated function is  $g(x) = -(x + 1)^2 + 8$ . The is still located at  $x = 1$ , and the height of the ball when  $x = 1$  is  $g(1) = -(1 + 1)^2 + 8 = 4$ , or 4 ft, so the ball will not go over the net.

**42.** C, E

**43.** B

**44.** **Part A** 6 m

**Part B** 600 m; The height of the cable is 60 m at both towers, and  $x = 0$  and  $x = 600$  when  $f(x) = 60$ , so the towers are 600 m apart.