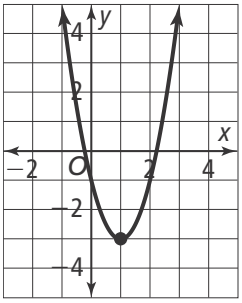
8-2 Additional Practice

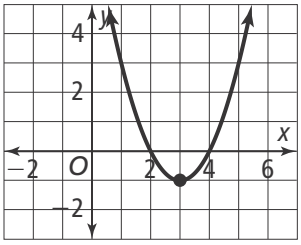
Quadratic Functions in Vertex Form

Identify the vertex, the axis of symmetry, and the direction of the graph for each of the following parabolas.

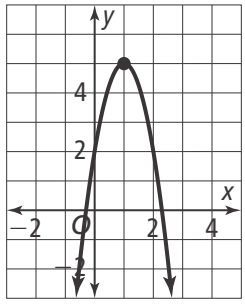
1.



2.



3.



Write the function for the graphs in Exercises 1–3 in vertex form.

4. Graph in Exercise 1 **5.** Graph in Exercise 2 **6.** Graph in Exercise 3

How does the value of *a*, *h*, or *k* affect the vertex for the graph of each function compared to the parent function $f(x) = x^2$?

7. $g(x) = (x - 8)^2$

8. $h(x) = (x + 4)^2 + 12$

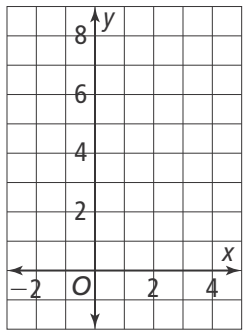
9. $j(x) = -\frac{1}{2}x^2 + 8$

Identify the vertex of the graph of each function.

10. $y = 4x^2 - 2$ **11.** $y = -2(x + 4)^2 - 6$ **12.** $y = x^2 + 5$

13. $y = (x - 12)^2$ **14.** $y = -9(x + 3)^2 - 3$ **15.** $y = -3x^2 - 7$

16. Graph the function $f(x) = 4(x - 2)^2 + 4$. Find the vertex and axis of symmetry.



17. Allie is playing basketball. She takes a shot 24 ft away from the basket. When the ball is 4 ft away from her, it is at a height of 10 ft above the floor. The ball reachs its highest height of 18 ft above the floor, when it is 12 feet away from her?

a. Find the value of *a*?

b. If the hoop is 10 ft high, how close would Allie have to be to make the basket?