

# 4-1

## Practice

Form G

### Quadratic Functions and Transformations

Graph each function.

1.  $y = 3x^2$

2.  $f(x) = -5x^2$

3.  $y = \frac{8}{3}x^2$

4.  $f(x) = -\frac{5}{6}x^2$

5.  $f(x) = \frac{87}{10}x^2$

6.  $f(x) = \frac{4}{5}x^2$

Graph each function. Describe how it was translated from  $f(x) = x^2$ .

7.  $f(x) = x^2 + 4$

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

Identify the vertex, axis of symmetry, the maximum or minimum value, and the domain and the range of each function.

9.  $y = (x - 2)^2 + 3$

10.  $f(x) = -0.2(x + 3)^2 + 2$

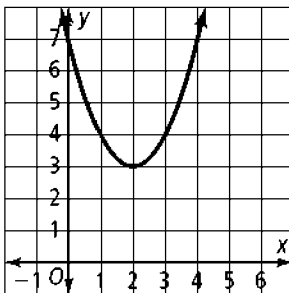
Graph each function. Identify the axis of symmetry.

11.  $y = (x + 2)^2 - 1$

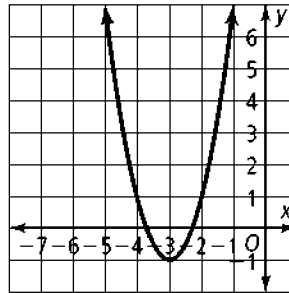
12.  $y = -4(x - 3)^2 + 2$

Write a quadratic function to model each graph.

13.



14.



## 4-1

**Practice** (continued)

Form G

**Quadratic Functions and Transformations**

**Describe how to transform the parent function  $y = x^2$  to the graph of each function below. Graph both functions on the same axes.**

15.  $y = 3(x + 2)^2$

16.  $y = -(x + 5)^2 + 1$

17.  $y = \frac{1}{2}(x + 4)^2 - 2$

18.  $y = -0.08(x - 0.04)^2 + 1.2$

**Write the equation of each parabola in vertex form.**

19. vertex  $(3, -2)$ , point  $(2, 3)$

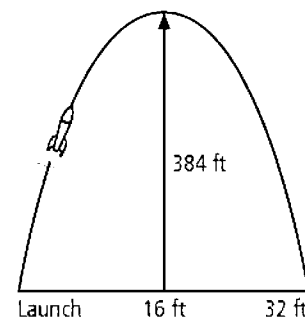
20. vertex  $\left(\frac{1}{2}, 1\right)$ , point  $(2, -8)$

21. vertex  $(-4, -24)$ , point  $(-5, -25)$

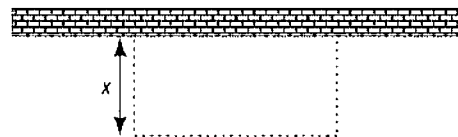
22. vertex  $(-12.5, 35.5)$ , point  $(1, 400)$

23. The amount of cloth used to make four curtains is given by the function  $A = -4x^2 + 40x$ , where  $x$  is the width of one curtain in feet and  $A$  is the total area in square feet. Find the width that maximizes the area of the curtains. What is the maximum area?

24. The diagram shows the path of a model rocket launched from the ground. It reaches a maximum altitude of 384 ft when it is above a location 16 ft from the launch site. What quadratic function models the height of the rocket?



25. To make an enclosure for chickens, a rectangular area will be fenced next to a house. Only three sides will need to be fenced. There is 120 ft of fencing material.



- What quadratic function represents the area of the rectangular enclosure, where  $x$  is the distance from the house?
- What dimensions will maximize the area of the enclosure?