

## 4-2

**Practice**

Form G

**Standard Form of a Quadratic Function**

**Identify the vertex, the axis of symmetry, the maximum or minimum value, and the range of each parabola.**

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

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

3.  $y = -x^2 - 6x - 10$

4.  $y = 3x^2 + 18x + 32$

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

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

**Graph each function.**

7.  $y = x^2 + 2x - 5$

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

9.  $y = 2x^2 + 4x - 4$

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

11.  $y = 3x^2 - 8x$

12.  $y = -3x^2 + 18x - 27$

**Write each function in vertex form.**

13.  $y = x^2 - 8x + 19$

14.  $y = x^2 - 2x - 6$

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

16.  $y = 2x^2 + x$

17.  $y = 2x^2 - 12x + 11$

18.  $y = -2x^2 - 4x + 6$

## 4-2

**Practice** (continued)

Form G

**Standard Form of a Quadratic Function**

19. A small independent motion picture company determines the profit  $P$  for producing  $n$  DVD copies of a recent release is  $P = -0.02n^2 + 3.40n - 16$ .  $P$  is the profit in thousands of dollars and  $n$  is in thousands of units.
- How many DVDs should the company produce to maximize the profit?
  - What will the maximize profit be?

**Sketch each parabola using the given information.**

20. vertex  $(4, -2)$ ,  $y$ -intercept 6

21. vertex  $(-3, 12)$ , point  $(-1, 0)$

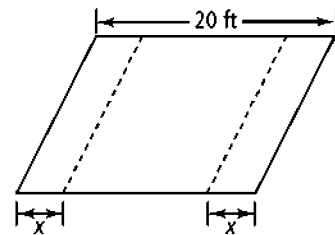
**For each function, the vertex of the function's graph is given. Find the unknown coefficients.**

22.  $y = x^2 + bx + c$ ;  $(-4, -7)$

23.  $y = ax^2 - 10x + c$ ;  $(-5, 20)$

24. A local nursery sells a large number of ornamental trees every year. The owners have determined the cost per tree  $C$  for buying and caring for each tree before it is sold is  $C = 0.001n^2 - 0.3n + 50$ . In this function,  $C$  is the cost per tree in dollars and  $n$  is the number of trees in stock.
- How many trees will minimize the cost per tree?
  - What will the minimum cost per tree be?

25. To line an irrigation ditch, a farmer will use rectangular metal sheets. Each side will be bent  $x$  feet from the edge at an angle of  $90^\circ$  to form the trough. If the sheets are 20 ft wide, how far from the edge ( $x$ ) should the farmer bend them to maximize the area of a cross-section of the trough.



**For each function, find the  $y$ -intercept.**

26.  $y = (x + 3)^2 - 5$

27.  $y = -2(x - 2)^2 + 6$

28.  $y = -(x + 1)^2 + 9$

29.  $y = \frac{1}{2}(x + 4)^2 - 15$