

**4-6****Practice**

Form G

## Completing the Square

Solve each equation by finding square roots.

1.  $3x^2 = 75$

2.  $5x^2 - 45 = 0$

3.  $4x^2 - 49 = 0$

4.  $6x^2 = 216$

5.  $2x^2 = 14$

6.  $3x^2 - 96 = 0$

7. A box is 4 in. high. Its length is 1.5 times its width. The volume of the box is  $1350 \text{ in.}^2$ . What are the width and length of the box?

Solve each equation.

8.  $x^2 + 12x + 36 = 25$

9.  $x^2 - 10x + 25 = 144$

10.  $x^2 + 6x + 9 = \frac{49}{4}$

11.  $x^2 - 22x + 121 = 225$

12.  $16x^2 + 8x + 1 = 16$

13.  $25x^2 - 30x + 9 = 81$

Complete the square.

14.  $x^2 + 22x +$

15.  $x^2 - 30x +$

16.  $x^2 + 5x +$

17.  $x^2 - \frac{1}{2}x +$

18.  $25x^2 + 10x +$

19.  $4x^2 - 12x +$

Solve each quadratic equation by completing the square.

20.  $x^2 + 10x - 1 = 0$

21.  $x^2 + 2x - 7 = 0$

22.  $-x^2 + 6x + 10 = 0$

23.  $x^2 + 5x = 3x + 11$

24.  $3x^2 + 4x = 2x^2 + 3$

25.  $x^2 - 2x - \frac{3}{4} = 0$

26.  $-0.2x^2 + 0.4x + 0.8 = 0$

27.  $4x^2 + 20x + 1 = 0$

4-6

## Practice (continued)

Form G

## Completing the Square

Rewrite each equation in vertex form.

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

29.  $y = x^2 + 14x + 50$

30.  $y = 3x^2 + 8x + 2$

31.  $y = -2x^2 + 6x - 2$

Find the value of  $k$  that would make the left side of each equation a perfect square trinomial.

32.  $x^2 + kx + 196 = 0$

33.  $64x^2 - kx + 1 = 0$

34.  $x^2 - kx + 16 = 0$

35.  $4x^2 - kx + 9 = 0$

36.  $16x^2 + kx + 9 = 0$

37.  $\frac{1}{4}x^2 - kx + \frac{1}{25} = 0$

38. The quadratic function  $d = -t^2 + 4t + 33$  models the depth of water in a flood channel after a rainstorm. The time in hours after it stops raining is  $t$  and  $d$  is the depth of the water in feet.

- Solve the equation  $-t^2 + 4t + 33 = 0$ .
- Approximate the positive solution found in part (a) to two decimal places.
- Interpret the answer to part (b) in terms of the problem.

39. While in orbit, a space scientist measures the pressure inside a container as it is being heated and then cooled. She records the information and discovers the pressure  $p$ , in pounds per square inch, is related to the time  $t$  in minutes after the experiment begins according to the equation  $p = -0.2t^2 + 1.6t$ .

- Complete the square in the expression  $-0.2t^2 + 1.6t$ .
- Rewrite the equation for  $p$  in vertex form.
- What is a reasonable domain for this function? Explain.
- When does the maximum pressure occur? What is the maximum pressure?