Exercise Set A

Factor the trinomial.

1. $-x^2 - 3x + 28$

2. $-p^2 + 8p - 12$

3. $-m^2 - 13m - 40$

4. $2y^2 + 15y + 7$

5. $3a^2 - 13a + 4$

6. $5d^2 - 18d - 8$

7. $6c^2 + 7c + 2$

8. $10n^2 - 26n + 12$

9. $12w^2 + 8w - 15$

10. $-2b^2 - 5b + 12$

11. $-3r^2 - 17r - 10$

12. $-4s^2 + 6s + 4$

Solve the equation.

13. $-x^2 + x + 20 = 0$

14. $-m^2 - 10m - 16 = 0$

15. $-p^2 + 13p - 42 = 0$

16. $2c^2 - 11c + 5 = 0$

17. $2y^2 + y - 10 = 0$

18. $16r^2 + 18r + 5 = 0$

19. $3w^2 + 19w + 6 = 0$

20. $12n^2 - 11n + 2 = 0$

21. $15a^2 - 2a - 8 = 0$

22. $-2x^2 - 9x - 4 = 0$

**23.** $-3s^2 - s + 10 = 0$

24. $8d^2 - 6d - 5 = 0$

25. **Error Analysis** *Describe* and correct the error in solving $6x^2 + x = 5$.

$$6x^2 + x = 5 \qquad x = 5 \text{ or } 6x + 1 = 5$$
$$x(6x + 1) = 5 \qquad x = 5 \text{ or } x = \frac{2}{3} \qquad \times$$

Find the zeros of the polynomial function.

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

27. $f(x) = 6x^2 + 45x - 24$

28. $f(x) = -3x^2 - 14x + 24$

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

30. $f(x) = 3x^2 - 17x + 20$

31. $f(x) = 8x^2 + 53x - 21$

32. $f(x) = 4x^2 + 29x + 30$

33. $f(x) = -2x^2 - 17x + 30$

34. $f(x) = 10x^2 + 5x - 5$

35. **Wall Mirror** You plan on making a wall hanging that contains two small mirrors as shown.
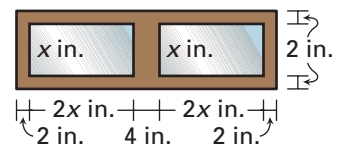
a. Write a polynomial that represents the area of the wall hanging.

b. The area of the wall hanging will be 480 square inches. Find the length and width of the mirrors you will use.

36. **Multiple Representations** An African cat called a serval leaps from the ground in an attempt to catch a bird. The serval's initial vertical velocity is 28 feet per second.

a. **Writing an Equation** Write an equation that gives the serval's height h (in feet) as a function of the time t (in seconds) since it left the ground.

b. **Making a Table** Use the equation from part (a) to make a table that shows the height of the serval for $t = 0, 0.25, 0.5, 0.75, 1, 1.25, 1.5$ and 1.75 seconds.

c. **Drawing a Graph** Plot the ordered pairs in the table as points in a coordinate plane. Connect the points with a smooth curve. After how many seconds does the serval first reach a height of 10 feet? *Justify* your answer using the equation from part (a).

UNIT 2

LESSON 2.7

Exercise Set B

MM1A2f   Factor expressions by greatest common factor, grouping, trial and error, and special products.

Factor the trinomial.

1. $-x^2 - 11x + 180$
2. $-2m^2 + 19m - 24$
3. $-3p^2 + 26p + 40$
4. $8r^2 + 26r + 15$
5. $14b^2 + 38b - 12$
6. $10y^2 - 36y + 18$

Solve the equation.

7. $-32x^2 - 28x + 15 = 0$
8. $-8n^2 - 16n - 6 = 0$
9. $-15s^2 + 4s + 4 = 0$
10. $-6p^2 - 17p - 5 = 0$
11. $63m^2 - 31m - 10 = 0$
12. $40r^2 - 42r + 9 = 0$
13. $16a^2 - 2a - 3 = 0$
14. $-15d^2 - 2d + 8 = 0$
15. $-6y^2 + 32y - 10 = 0$

Find the zeros of the polynomial function.

16. $f(x) = -16x^2 + 50x - 25$
17. $h(x) = -20x^2 + 44x - 21$
18. $h(x) = 20x^2 + 18x - 44$
19. $g(x) = -36x^2 - 30x - 6$
20. $f(x) = 12x^2 + 8x - 15$
21. $g(x) = 21x^2 + 14x - 7$

Multiply each side of the equation by an appropriate power of 10 to obtain integer coefficients. Then solve the equation.

22. $0.2x^2 - 0.3x - 3.5 = 0$
23. $r^2 + 0.6r - 0.4 = 0$
24. $0.8m^2 + m - 0.3 = 0$
25. $-0.5x^2 + 1.2x = 0.4$
26. $1.2(p^2 + 1) = 2.5p$
27. $-0.36n^2 + 0.6n - 0.25 = 0$

28. **Baseball** A baseball player releases a baseball at a height of 7 feet with an initial vertical velocity of 54 feet per second. How long will it take the ball to reach the ground?

29. **Rocket Launch** A miniature rocket is launched off a roof 20 feet above the ground with an initial vertical velocity of 22 feet per second. How much time will elapse before the rocket reaches the ground?

30. **Frog Jump** A frog jumps from the ground into the air with an initial vertical velocity of 8 feet per second.
    a. Write an equation that gives the frog's height (in feet) as a function of the time (in seconds) since it left the ground.
    b. After how many seconds is the frog 12 inches above the ground?
    c. Does the frog go any higher than 12 inches? *Explain* your reasoning using your answer from part (b).
    d. Suppose the frog now jumps from 4 feet above the ground with the same initial vertical velocity. Write an equation that gives the frog's height (in feet) as a function of the time (in seconds) since it left the ground.
    e. Should the frog reach the ground in the same time in both jumps? *Explain* why or why not.