

**LESSON**  
**8.7****Practice C**

For use with the lesson "Factor Special Products"

**Factor the polynomial.**

- |                              |                                     |                               |
|------------------------------|-------------------------------------|-------------------------------|
| 1. $25x^2 - 81$              | 2. $225p^2 - 100$                   | 3. $121w^2 - 625$             |
| 4. $36m^2 - 64$              | 5. $\frac{9}{16}r^2 - \frac{1}{16}$ | 6. $81x^2 - 49y^2$            |
| 7. $-3y^2 - 48y - 192$       | 8. $4n^2 - 40n + 100$               | 9. $12z^2 + 12z + 3$          |
| 10. $24a^2 - 120ab + 150b^2$ | 11. $-18s^2 - 48st - 32t^2$         | 12. $5z^2 + 2z + \frac{1}{5}$ |

**Solve the equation.**

- |                               |  |                              |
|-------------------------------|--|------------------------------|
| 13. $25m^2 - 64 = 0$          | 14. $2p^2 + 36p + 162 = 0$                   | 15. $-16r^2 + 196 = 0$       |
| 16. $3w^2 - 60w + 300 = 0$    | 17. $36x^2 - 132x + 121 = 0$                 | 18. $225a^2 - 120a + 16 = 0$ |
| 19. $-75y^2 - 90y - 27 = 0$   | 20. $196n^2 - 224n + 64 = 0$                 | 21. $160z^2 = 640$           |
| 22. $0.9r^2 - 4.8r + 6.4 = 0$ | 23. $\frac{25}{2}b^2 + 5b + \frac{1}{2} = 0$ | 24. $-96d^2 + 144d - 54 = 0$ |

**Determine the value(s) of  $k$  that make the expression a perfect square trinomial.**

- |                       |                        |                          |
|-----------------------|------------------------|--------------------------|
| 25. $81x^2 + kx + 25$ | 26. $100x^2 + kx + 49$ | 27. $25x^2 - 60x + k$    |
| 28. $kx^2 + 72x + 81$ | 29. $4x^2 - 12x + k$   | 30. $49x^2 + kxy + 4y^2$ |

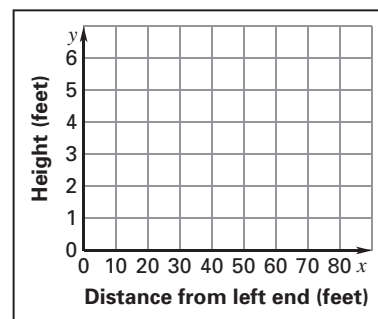
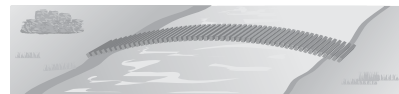
31. **Squirrel** A squirrel jumps straight up with an initial vertical velocity of 16 feet per second. How many times does the squirrel reach a height of 4 feet? *Explain* your answer.

32. **Foot Bridge** A foot bridge that spans a small creek can be modeled by the equation

$$y = -\frac{3}{800}x^2 + \frac{3}{10}x$$

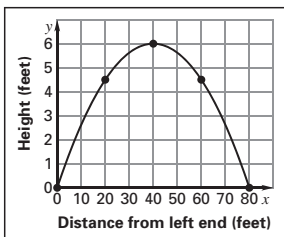
where  $x$  and  $y$  are measured in feet.

- Make a table of values that shows the height of the bridge for  $x = 0, 20, 40, 60,$  and 80 feet from the left end.
- For what additional values of  $x$  does the equation make sense? *Explain.*
- Plot the ordered pairs in the table from part (a) as points in the coordinate plane. Connect the points with a smooth curve.
- At approximately what distance from the left end does the bridge reach a height of 6 feet? Check your answer algebraically.



## Lesson 8.7 Factor Special Products, continued

31. Only once, because the squirrel reaches the ground in 1 second and it takes the squirrel 0.5 second (half this time) to reach the height of 4 feet.  
 32. **a.** 0; 4.5; 6; 4.5; 0 **b.** Any other values between 0 and 80 because the bridge is on the ground at  $x = 0$  and meets the ground again at  $x = 80$ .  
**c.**



**d.** 40 ft

### Study Guide

1.  $(m + 11)(m - 11)$  2.  $(3n - 8)(3n + 8)$   
 3.  $3(y + 7z)(y - 7z)$  4.  $(m - \frac{1}{4})^2$   
 5.  $(4r + 5s)^2$  6.  $9(2x - 1)^2$  7. 5 8.  $-\frac{9}{4}, \frac{9}{4}$

### Real-Life Application

1.  $A = \pi R^2$  2.  $A = \pi r^2$  3.  $A = \pi(R^2 - r^2)$   
 4.  $A = \pi(R + r)(R - r)$  5.  $A = 4R^2$   
 6.  $W = 4R^2 - \pi R^2 + \pi r^2$  7.  $A = 0.98175$   
 8.  $W = 1.26825$  9.  $\frac{1.26825}{2.25} = 56\%$  waste

### Challenge Practice

1.  $(x - 3y)^2$  2.  $(2x - 5y)^2$  3.  $(5xy + 4)^2$   
 4.  $4(x - 10)^2$  5.  $(5x + 13)^2$   
 6.  $5 - \sqrt{5}, 5 + \sqrt{5}$  7.  $\frac{1}{2} \cdot \sqrt[3]{\frac{7}{2}} + \frac{7}{2}$  8.  $-\frac{13}{5}$   
 9.  $-\frac{4}{7}$  10.  $-\frac{5}{2}$

## Lesson 8.8 Factor Polynomials Completely

### Teaching Guide

1.  The graphs are the same.

2. Because the binomial  $(x - 3)$  is common to each term, you can factor out  $(x - 3)$  to obtain  $(x - 3)(x + 5)$ .

3.  $(x + 1)(x - 9); (x - 10)(3x + 2)$

### Practice Level A

1. C 2. A 3. B 4.  $(x + 1)(x + 4)$   
 5.  $(b - 1)(b + 3)$  6.  $(2m + 1)(m + 1)$   
 7.  $(5r - 1)(r + 2)$  8.  $(w + 3)(w + 6)$   
 9.  $(y - 6)(y + 4)$  10.  $(n - 7)(n - 3)$   
 11.  $(3z + 8)(z - 4)$  12.  $(2p - 3)(p + 5)$   
 13.  $(x + 3)(x + 1)$  14.  $(x + 2)(x - 1)$   
 15.  $(x - 1)(x + 8)$  16.  $(x^2 + 2)(x - 5)$   
 17.  $(x^2 - 6)(x - 4)$  18.  $(x^2 + 5)(x + 3)$   
 19.  $(x^2 + 7)(x - 1)$  20.  $(x^2 - 3)(x + 3)$   
 21.  $(x^2 - 1)(x + 3)$  22. not completely factored  
 23. completely factored 24. not completely factored  
 25.  $x^3(x - 1)(x + 1)$   
 26.  $a^2(2a - 5)(2a + 5)$  27.  $5y^4(y - 5)(y + 5)$   
 28.  $-5, -1, 5$  29.  $-4, -1, 4$  30.  $-2, 1, 2$   
 31.  $-3, 1, 3$  32.  $-2, 0, 2$  33.  $-8, 0, 8$   
 34.  $4(x + 1)(x + 2)$  35. **a.**  $8\pi r^2 - 72\pi = 0$   
**b.** 3 in. 36. 2 sec

### Practice Level B

1.  $(4x - 3)(x + 5)$  2.  $-2(a - 6)(a - 3)$   
 3.  $(w^2 - 5)(w + 8)$  4.  $(2b^2 + 3)(b + 6)$   
 5.  $(y - 1)(x + 15)$  6.  $3(x - 2)(y + 4)$   
 7.  $(x^2 + 1)(x + 1)$  8.  $(y^2 + 1)(y - 14)$   
 9.  $(m^2 + 2)(m - 6)$  10.  $(p^2 + 4)(p + 9)$   
 11.  $(t^2 - 2)(t + 12)$  12.  $(3n^2 + 1)(n - 1)$   
 13.  $7x^2(x + 4)$  14.  $4m(m - 2)(m + 2)$   
 15.  $-2p(8p^2 + 1)$  16.  $6r^2(8r - 5)$   
 17.  $15y(1 - 4y)$  18.  $6x(3y - 4x)$   
 19.  $5(m^2 + 4m + 8)$  20.  $6(x + 5)(x - 4)$   
 21.  $4z(z - 2)(z + 1)$  22.  $9(x^3 + 4x^2 + 4)$   
 23.  $(x^2 + 5)(x + 1)$  24.  $(d^2 + 5)(d + 4)$   
 25.  $-4, -2$  26.  $-5, 5$  27.  $\frac{7}{2}$  28.  $-\frac{1}{2}, -1$   
 29.  $\frac{4}{3}$  30.  $-\frac{5}{3}$  31.  $2(2x + 3)(x + 1)$   
 32. **a.**  $8\pi r^2 - 32\pi = 0$  **b.** 2 cm  
 33. **a.**  $h = -16t^2 + 4t + 2$  **b.** 2.24 ft **c.** 2 ft  
**d.** about 0.5 sec

### Practice Level C

1.  $13a(1 - 2a)$  2.  $15x(2y - 3x)$   
 3.  $-2(m + 1)(m + 7)$  4.  $7(2p - 3)(p - 1)$