

# 4.4 EXERCISES

## HOMEWORK KEY

 = **WORKED-OUT SOLUTIONS**  
on p. WS1 for Exs. 27, 39, and 63

 = **TAKS PRACTICE AND REASONING**  
Exs. 12, 64, 65, 67, 69, and 70

### SKILL PRACTICE

- VOCABULARY** What is the greatest common monomial factor of the terms of the expression  $12x^2 + 8x + 20$ ?
- WRITING** Explain how the values of  $a$  and  $c$  in  $ax^2 + bx + c$  help you determine whether you can use a perfect square trinomial factoring pattern.

#### EXAMPLES 1 and 2

on p. 259  
for Exs. 3–12

**FACTORING** Factor the expression. If the expression cannot be factored, say so.

- |                    |                     |                       |
|--------------------|---------------------|-----------------------|
| 3. $2x^2 + 5x + 3$ | 4. $3n^2 + 7n + 4$  | 5. $4r^2 + 5r + 1$    |
| 6. $6p^2 + 5p + 1$ | 7. $11z^2 + 2z - 9$ | 8. $15x^2 - 2x - 8$   |
| 9. $4y^2 - 5y - 4$ | 10. $14m^2 + m - 3$ | 11. $9d^2 - 13d - 10$ |

12.  **TAKS REASONING** Which factorization of  $5x^2 + 14x - 3$  is correct?

- (A)  $(5x - 3)(x + 1)$                       (B)  $(5x + 1)(x - 3)$   
(C)  $5(x - 1)(x + 3)$                       (D)  $(5x - 1)(x + 3)$

#### EXAMPLE 3

on p. 260  
for Exs. 13–21

**FACTORING WITH SPECIAL PATTERNS** Factor the expression.

- |                      |                        |                         |
|----------------------|------------------------|-------------------------|
| 13. $9x^2 - 1$       | 14. $4r^2 - 25$        | 15. $49n^2 - 16$        |
| 16. $16s^2 + 8s + 1$ | 17. $49x^2 + 70x + 25$ | 18. $64w^2 + 144w + 81$ |
| 19. $9p^2 - 12p + 4$ | 20. $25t^2 - 30t + 9$  | 21. $36x^2 - 84x + 49$  |


#### EXAMPLE 4

on p. 260  
for Exs. 22–31

**FACTORING MONOMIALS FIRST** Factor the expression.

- |                        |                         |                                |
|------------------------|-------------------------|--------------------------------|
| 22. $12x^2 - 4x - 40$  | 23. $18z^2 + 36z + 16$  | 24. $32v^2 - 2$                |
| 25. $6u^2 - 24u$       | 26. $12m^2 - 36m + 27$  | <b>27.</b> $20x^2 + 124x + 24$ |
| 28. $21x^2 - 77x - 28$ | 29. $-36n^2 + 48n - 15$ | 30. $-8y^2 + 28y - 60$         |

31. **ERROR ANALYSIS** Describe and correct the error in factoring the expression.

$$\begin{aligned} 4x^2 - 36 &= 4(x^2 - 36) \\ &= 4(x + 6)(x - 6) \end{aligned}$$


#### EXAMPLE 5

on p. 261  
for Exs. 32–40

**SOLVING EQUATIONS** Solve the equation.

- |                          |                                |                            |
|--------------------------|--------------------------------|----------------------------|
| 32. $16x^2 - 1 = 0$      | 33. $11q^2 - 44 = 0$           | 34. $14s^2 - 21s = 0$      |
| 35. $45n^2 + 10n = 0$    | 36. $4x^2 - 20x + 25 = 0$      | 37. $4p^2 + 12p + 9 = 0$   |
| 38. $15x^2 + 7x - 2 = 0$ | <b>39.</b> $6r^2 - 7r - 5 = 0$ | 40. $36z^2 + 96z + 15 = 0$ |

#### EXAMPLE 7

on p. 262  
for Exs. 41–49

**FINDING ZEROS** Find the zeros of the function by rewriting the function in intercept form.

- |                           |                            |                             |
|---------------------------|----------------------------|-----------------------------|
| 41. $y = 4x^2 - 19x - 5$  | 42. $g(x) = 3x^2 - 8x + 5$ | 43. $y = 5x^2 - 27x - 18$   |
| 44. $f(x) = 3x^2 - 3x$    | 45. $y = 11x^2 - 19x - 6$  | 46. $y = 16x^2 - 2x - 5$    |
| 47. $y = 15x^2 - 5x - 20$ | 48. $y = 18x^2 - 6x - 4$   | 49. $g(x) = 12x^2 + 5x - 7$ |