4.2 EXERCISES

HOMEWORK KEY

= **WORKED-OUT SOLUTIONS** on p. WS1 for Exs. 19, 29, and 53

= **TAKS PRACTICE AND REASONING** Exs. 12, 22, 49, 54, 55, 57, and 58

SKILL PRACTICE

1. **VOCABULARY** Copy and complete: A quadratic function in the form $y = a(x - h)^2 + k$ is in __?__ form.

2. **WRITING** *Explain* how to find a quadratic function's maximum value or minimum value when the function is given in intercept form.

EXAMPLE 1 on p. 245 for Exs. 3–12

GRAPHING WITH VERTEX FORM **Graph the function. Label the vertex and axis of symmetry.**

3. $y = (x - 3)^2$
4. $y = (x + 4)^2$
5. $f(x) = -(x + 3)^2 + 5$
6. $y = 3(x - 7)^2 - 1$
7. $g(x) = -4(x - 2)^2 + 4$
8. $y = 2(x + 1)^2 - 3$
9. $f(x) = -2(x - 1)^2 - 5$
10. $y = -\frac{1}{4}(x + 2)^2 + 1$
11. $y = \frac{1}{2}(x - 3)^2 + 2$

12. **TAKS REASONING** What is the vertex of the graph of the function $y = 3(x + 2)^2 - 5$?

(A) $(2, -5)$ (B) $(-2, -5)$ (C) $(-5, 2)$ (D) $(5, -2)$

EXAMPLE 3 on p. 247 for Exs. 13–23

GRAPHING WITH INTERCEPT FORM **Graph the function. Label the vertex, axis of symmetry, and *x*-intercepts.**

13. $y = (x + 3)(x - 3)$
14. $y = (x + 1)(x - 3)$
15. $y = 3(x + 2)(x + 6)$
16. $f(x) = 2(x - 5)(x - 1)$
17. $y = -(x - 4)(x + 6)$
18. $g(x) = -4(x + 3)(x + 7)$
19. $y = (x + 1)(x + 2)$
20. $f(x) = -2(x - 3)(x + 4)$
21. $y = 4(x - 7)(x + 2)$

22. **TAKS REASONING** What is the vertex of the graph of the function $y = -(x - 6)(x + 4)$?

(A) $(1, 25)$ (B) $(-1, 21)$ (C) $(-6, 4)$ (D) $(6, -4)$

23. **ERROR ANALYSIS** *Describe* and correct the error in analyzing the graph of the function $y = 5(x - 2)(x + 3)$.

> The x-intercepts of the graph are −2 and 3. ✗

EXAMPLES 5 and 6 on p. 248 for Exs. 24–32

WRITING IN STANDARD FORM **Write the quadratic function in standard form.**

24. $y = (x + 4)(x + 3)$
25. $y = (x - 5)(x + 3)$
26. $h(x) = 4(x + 1)(x - 6)$
27. $y = -3(x - 2)(x - 4)$
28. $f(x) = (x + 5)^2 - 2$
29. $y = (x - 3)^2 + 6$
30. $g(x) = -(x + 6)^2 + 10$
31. $y = 5(x + 3)^2 - 4$
32. $f(x) = 12(x - 1)^2 + 4$

MINIMUM OR MAXIMUM VALUES **Find the minimum value or the maximum value of the function.**

33. $y = 3(x - 3)^2 - 4$
34. $g(x) = -4(x + 6)^2 - 12$
35. $y = 15(x - 25)^2 + 130$
36. $f(x) = 3(x + 10)(x - 8)$
37. $y = -(x - 36)(x + 18)$
38. $y = -12x(x - 9)$
39. $y = 8x(x + 15)$
40. $y = 2(x - 3)(x - 6)$
41. $g(x) = -5(x + 9)(x - 4)$