

10.2 EXERCISES

HOMEWORK KEY

- = **WORKED-OUT SOLUTIONS** on p. WS1 for Exs. 9 and 41
- ➔ = **TAKS PRACTICE AND REASONING** Exs. 12, 27, 42, 44, 46, and 47

SKILL PRACTICE

- VOCABULARY** Explain how you can tell whether a quadratic function has a maximum value or minimum value without graphing the function.
- WRITING** Describe the steps you would take to graph a quadratic function in standard form.

EXAMPLE 1

on p. 635
for Exs. 3–14

FINDING AXIS OF SYMMETRY AND VERTEX Find the axis of symmetry and the vertex of the graph of the function.

- | | | |
|------------------------------|-----------------------------------|------------------------------------|
| 3. $y = 2x^2 - 8x + 6$ | 4. $y = x^2 - 6x + 11$ | 5. $y = -3x^2 + 24x - 22$ |
| 6. $y = -x^2 - 10x$ | 7. $y = 6x^2 + 6x$ | 8. $y = 4x^2 + 7$ |
| 9. $y = -\frac{2}{3}x^2 - 1$ | 10. $y = \frac{1}{2}x^2 + 8x - 9$ | 11. $y = -\frac{1}{4}x^2 + 3x - 2$ |

12. ➔ **TAKS REASONING** What is the vertex of the graph of the function $y = -3x^2 + 18x - 13$?

- (A) (-3, -94) (B) (-3, -14) (C) (3, -13) (D) (3, 14)

ERROR ANALYSIS Describe and correct the error in finding the axis of symmetry of the graph of the given function.

13. $y = 2x^2 + 16x - 1$

$$x = \frac{b}{2a} = \frac{16}{2(2)} = 4$$

The axis of symmetry is $x = 4$.

14. $y = -\frac{3}{2}x^2 + 18x - 5$

$$x = -\frac{b}{2a} = -\frac{18}{2\left(\frac{3}{2}\right)} = -6$$

The axis of symmetry is $x = -6$.

EXAMPLE 2

on p. 636
for Exs. 15–27

GRAPHING QUADRATIC FUNCTIONS Graph the function. Label the vertex and axis of symmetry.

- | | | |
|-----------------------------------|------------------------------------|---|
| 15. $y = x^2 + 6x + 2$ | 16. $y = x^2 + 4x + 8$ | 17. $y = 2x^2 + 7x + 21$ |
| 18. $y = 5x^2 + 10x - 3$ | 19. $y = 4x^2 + x - 32$ | 20. $y = -4x^2 + 4x + 8$ |
| 21. $y = -3x^2 - 2x - 5$ | 22. $y = -8x^2 - 12x + 1$ | 23. $y = -x^2 + \frac{1}{4}x + \frac{1}{2}$ |
| 24. $y = \frac{1}{3}x^2 + 6x - 9$ | 25. $y = -\frac{1}{2}x^2 + 6x + 3$ | 26. $y = -\frac{1}{4}x^2 - x + 1$ |

27. ➔ **TAKS REASONING** Which function has the graph shown?

- (A) $y = -2x^2 + 8x + 3$
 (B) $y = -\frac{1}{2}x^2 + 2x + 3$
 (C) $y = \frac{1}{2}x^2 + 2x + 3$
 (D) $y = 2x^2 + 8x + 3$

