

68. **OPEN ENDED** Write and graph a quadratic function for which the graph has the axis of symmetry  $x = -\frac{3}{8}$ . Summarize the steps that you took.
69. **FIND THE ERROR** Chase and Jade are finding the axis of symmetry of a parabola. Is either of them correct? Explain your reasoning.

*Chase*

$$y = -x^2 - 4x + 6$$

$$x = -\frac{b}{2a}$$

$$x = -\frac{4}{2(-1)}$$

$$x = 2$$

*Jade*

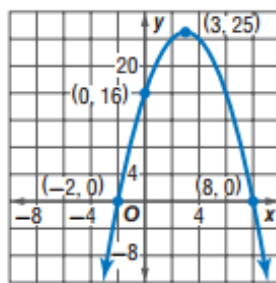
$$y = -x^2 - 4x + 6$$

$$x = -\frac{b}{2a}$$

$$x = -\frac{-4}{2(-1)}$$

$$x = -2$$

70. **CHALLENGE** Using the axis of symmetry and one  $x$ -intercept, write an equation for the graph shown.
71. **REASONING** The graph of a quadratic function has a vertex at  $(2, 0)$ . One point on the graph is  $(5, 9)$ . Find another point on the graph. Explain how you found the point.
72. **OPEN ENDED** Write a real-world situation that describes a quadratic equation. Explain what the vertex represents.
73. **REASONING** Provide a counterexample to the following statement. *The vertex of a parabola is always the minimum of the graph.*
74. **WRITING IN MATH** Explain how to find the axis of symmetry from a quadratic equation. Then explain what other characteristics of a graph you can derive from this, and how you would do that.



Find the vertex, the equation of the axis of symmetry, and the  $y$ -intercept of each function.

34.  $y = x^2 + 8x + 10$       35.  $y = 2x^2 + 12x + 10$       36.  $y = -3x^2 - 6x + 7$
37.  $y = -x^2 - 6x - 5$       38.  $y = 5x^2 + 20x + 10$       39.  $y = 7x^2 - 28x + 14$
40.  $y = 2x^2 - 12x + 6$       41.  $y = -3x^2 + 6x - 18$       42.  $y = -x^2 + 10x - 13$

Consider each function.

- Determine whether the function has a *maximum* or *minimum* value.
- State the maximum or minimum value.
- What are the domain and range of the function?

43.  $y = -2x^2 - 8x + 1$       44.  $y = x^2 + 4x - 5$       45.  $y = 3x^2 + 18x - 21$
46.  $y = -2x^2 - 16x + 18$       47.  $y = -x^2 - 14x - 16$       48.  $y = 4x^2 + 40x + 44$
49.  $y = -x^2 - 6x - 5$       50.  $y = 2x^2 + 4x + 6$       51.  $y = -3x^2 - 12x - 9$