Problem 1 – Vertex form

- Write the vertex form of a quadratic equation.

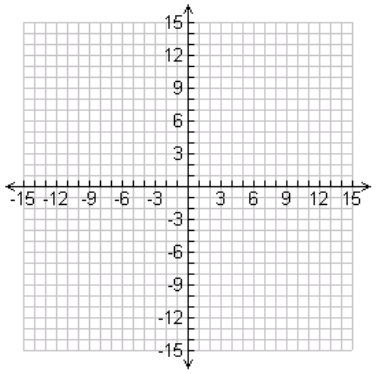
- What are the coordinates of the vertex?

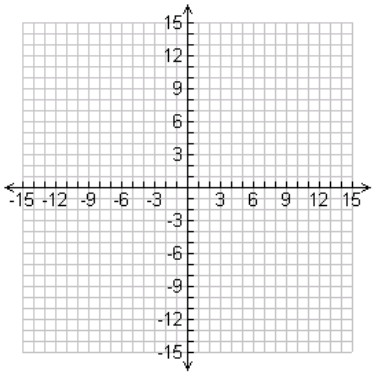
- What is the equation of the axis of symmetry?

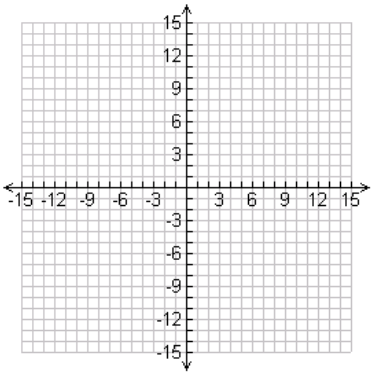
- When does the graph of a quadratic function have a maximum? a minimum?

- Sketch the graph of each function. Then check your graphs on page 1.6.

$y = x^2 - 3$ $y = (x - 7)^2$ $y = -(x + 5)^2 + 4$







Problem 2 – Standard form

- Write the standard form of a quadratic equation.

- What is the *y*-intercept?

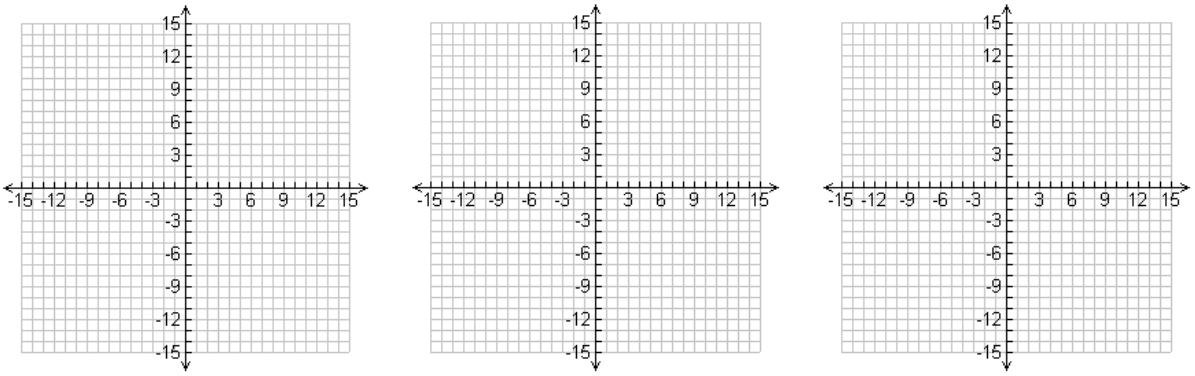
- What is the *x*-coordinate of the vertex?

- What is the equation of the axis of symmetry?

- How can you find the *y*-coordinate of the vertex?

- Sketch the graph of each function. Then check your graphs on page 2.7.

$y = x^2 + 6x + 2$ $y = -x^2 - 4x$ $y = -2x^2 + 8x + 5$



Extension

Expand the vertex form of a general quadratic function and group the terms, and compare it to the standard form. Use it to explain why the axis of symmetry is $x = \frac{b}{-2a}$ and why *c* is the *y*-intercept.