

**5.8 Homework: Graphing and interpreting quadratic functions**

For each function, first factor it (always show this step), then state the roots using the form, “ $x = 3, 4$ ” (or whatever the values are).

1.  $f(x) = x^2 + 7x + 12$

4.  $f(x) = 2x^2 - 10x - 12$

2.  $f(x) = x^2 + 13x + 12$

5.  $f(x) = -3x^2 + 6x - 3$

3.  $f(x) = x^2 - 4x - 12$

6.  $f(x) = \frac{1}{2}x^2 + 2x + 2$

**Completing the square**

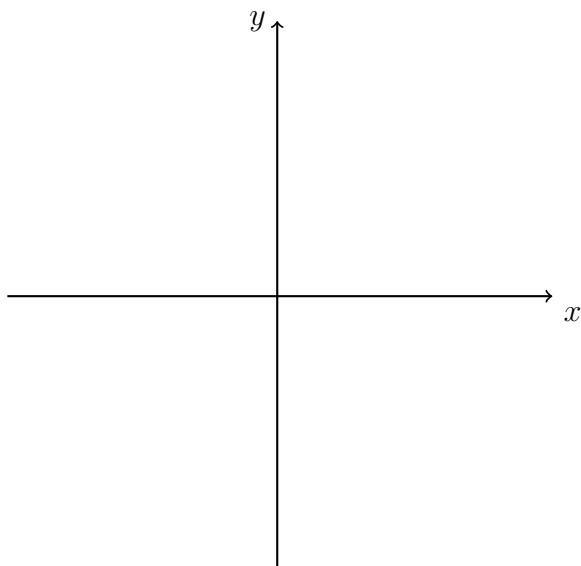
Rewrite the function in vertex form,  $f(x) = (x - h)^2 + k$ . Include the step showing the  $(-\frac{b}{2a})^2$  term.

7.  $f(x) = x^2 - 6x + 11$

8.  $f(x) = x^2 + 8x + 9$

Expand the function from vertex form to standard form,  $ax^2 + bx + c$  where  $a, b, c \in \mathbb{R}$ . Then factor the result and state the roots. Sketch the function, labeling the intercepts with values and the vertex as an ordered pair.

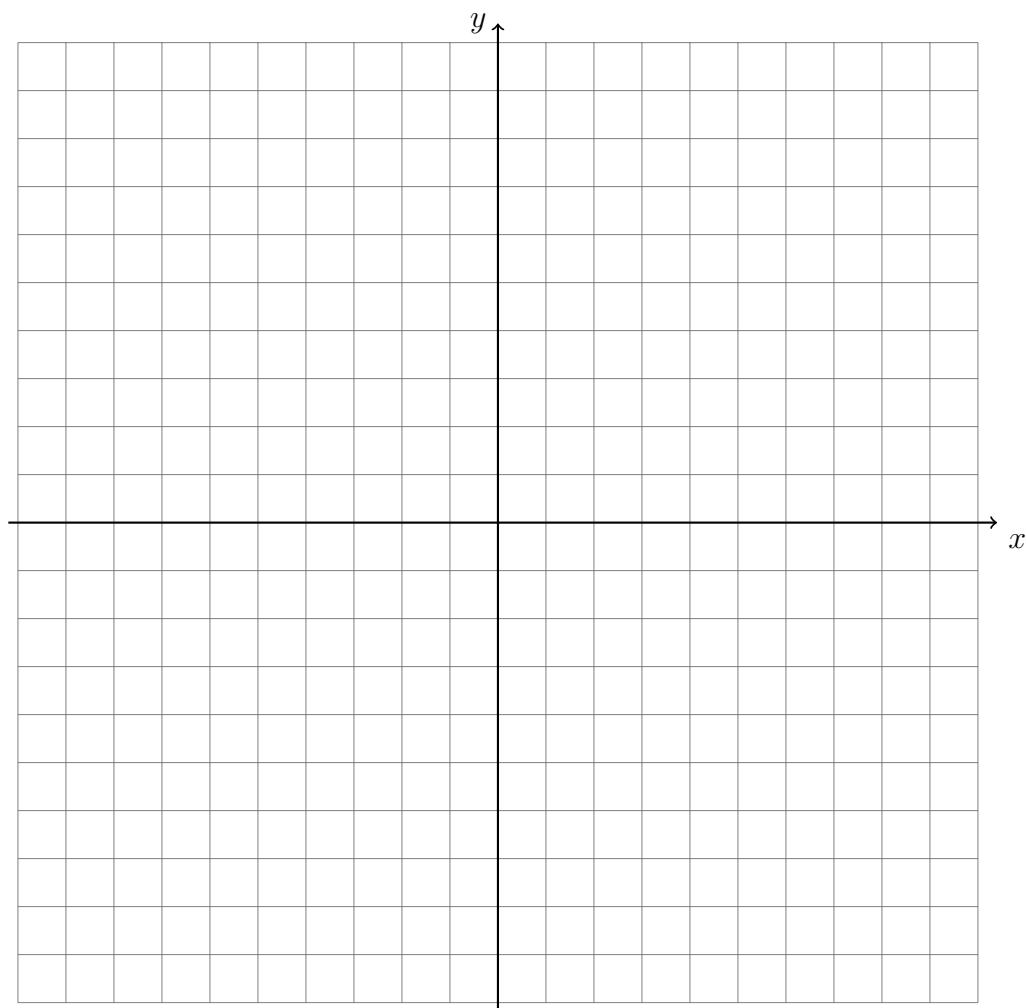
9.  $f(x) = (x - 2)^2 - 9$



**Graphing quadratics**

10. Graph the function  $f(x) = -x^2 - 4x + 5$ . You may use a graphing calculator rather than factoring the function and completing the square.

Label the scales with at least a few values. Mark the vertex as an ordered pair and label each intercept with its value.



**Model situations with quadratic functions**

Use a graphing calculator to view the graph and a table of values for the following function:

$$h(x) = -\frac{1}{225}x^2 + \frac{2}{3}x$$

where  $h(x)$  represents the height of an object and  $x$  it's horizontal position.

Make a table of values to the left of the graph, below. Include key values. Graph the function over domain where  $h(x) \geq 0$ . Use a horizontal scale of 1 square equals 10 units and vertical scale of 1 square equals 2.5 units. Label the intercepts and vertex.

