Name: _____   Date: _____

Learning Goal 3.3	Convert standard form of the quadratic equation to vertex form by completing the square.

Convert the following functions into vertex form of the equation.

a. $f(x) = x^2 - 9x - 38$

$x^2 - 9x +$ _____ is a perfect square trinomial?
$$x^2 - 9x + \frac{81}{4}$$

$$f(x) = \left(x^2 - 9x + \frac{81}{4}\right) - \frac{81}{4} - 38$$
$$= \left(x^2 - 9x + \frac{81}{4}\right) - \frac{81}{4} - \frac{152}{4}$$
$$= \left(x^2 - 9x + \frac{81}{4}\right) - \frac{233}{4}$$
$$= \left(x - \frac{9}{2}\right)^2 - \frac{233}{4}$$

b. $g(x) = x^2 - 2x + 3$

$x^2 - 2x +$ ____ is a perfect square trinomial?
$$x^2 - 2x + 1$$

$$g(x) = (x^2 - 2x + 1) - 1 + 3$$
$$= (x^2 - 2x + 1) + 2$$
$$= (x - 1)^2 + 2$$

c. $h(x) = x^2 + 10x + 14$

$x^2 + 10x +$ ____ is a perfect square trinomial?
$$x^2 + 10x + 25$$

$$h(x) = (x^2 + 10x + 25) - 25 + 14$$
$$= (x^2 + 10x + 25) - 11$$
$$= (x + 5)^2 - 11$$

a. $y = x^2 + 16x - 22$

$x^2 + 16x +$ ____ is a perfect square trinomial?
$$x^2 + 16x + 64$$

$$y = (x^2 + 16x + 64) - 64 - 22$$
$$= (x^2 + 16x + 64) - 86$$
$$= (x + 8)^2 - 86$$