

Writing Quadratics in Vertex Form by Completing the Square

$$f(x) = a(x-h)^2 + k$$

$$+ \left(\frac{b}{2}\right)^2 \quad \left(x + \frac{b}{2}\right)^2$$

$$f(x) = x^2 - 6x - 2$$

$$h(x) = 3x^2 - 6x - 15$$

$$\left(x^2 - 6x + \left(\frac{-6}{2}\right)^2\right) - 2 - \left(\frac{-6}{2}\right)^2$$

$$(x^2 - 6x + 9) - 2 - 9$$

$$f(x) = (x-3)^2 - 11 \quad (3, -11)$$

$$g(x) = x^2 - \frac{1}{2}x + 1 \quad \frac{-1/2}{2} \div 2$$

$$\left(x^2 - \frac{1}{2}x + \left(\frac{-1/2}{2}\right)^2\right) + 1 - \left(\frac{-1/2}{2}\right)^2$$

$$f(x) = -x^2 - 3x + 12$$