

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

Complete the
square

$$f(x) = x^2 + 16x + 14$$

$$f(x) - 14 = x^2 + 16x + 64$$

$$f(x) + 50 = (x + 8)^2$$

$$f(x) = (x + 8)^2 - 50$$

$$V(-8, -50)$$

$$y\text{-int } (0, 14)$$

$$f(x) = x^2 - 3x - 2 \quad \left(\frac{3}{2}\right)^2$$

$$f(x) + 2 = x^2 - 3x + 2.25 \quad \frac{9}{4}$$

$$f(x) + 4.25 = (x - 1.5)^2$$

$$f(x) = (x - 1.5)^2 - 4.25$$

$$V(1.5, -4.25)$$

$$y\text{-intercept } (0, -2)$$

$$f(x) = x^2 + 7x - 1$$

$$f(x) = x^2 + 20x - 80$$

$$f(x) + 80 = x^2 + 20x + 100$$

$$f(x) + 180 = (x + 10)^2$$

$$f(x) = (x + 10)^2 - 180$$

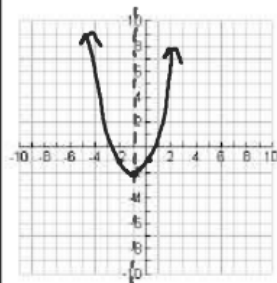
$$V(-10, -180)$$

$$y\text{-intercept } (0, -80)$$

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

Convert each quadratic to vertex form and then graph the function.

$$f(x) = x^2 + 2x - 1$$



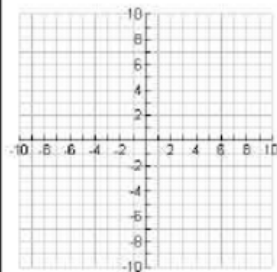
$$f(x) + 1 = x^2 + 2x + 1$$

$$f(x) + 2 = (x + 1)^2$$

$$f(x) = (x + 1)^2 - 2$$

$$V(-1, -2)$$

$$f(x) = x^2 - 12x - 5$$



$$f(x) + 5 = x^2 - 12x + 36$$

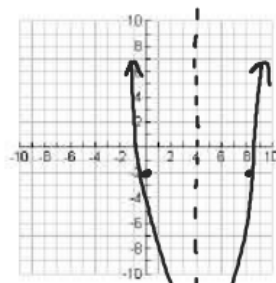
$$f(x) + 41 = (x - 6)^2$$

$$f(x) = (x - 6)^2 - 41$$

$$V(6, -41)$$

$$y\text{-inter } (0, -5)$$

$$f(x) = x^2 - 8x - 2$$



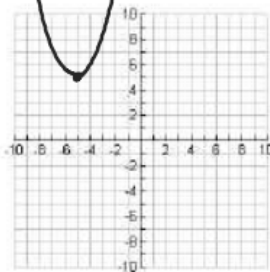
$$f(x) + 2 = x^2 - 8x + 16$$

$$f(x) + 18 = (x - 4)^2$$

$$f(x) = (x - 4)^2 - 18$$

$$V(4, -18)$$

$$f(x) = x^2 + 10x + 30$$



$$f(x) - 30 = x^2 + 10x + 25$$

$$f(x) - 5 = (x + 5)^2$$

$$f(x) = (x + 5)^2 + 5$$

$$V(-5, 5)$$

$$y\text{-inter } (0, 30)$$