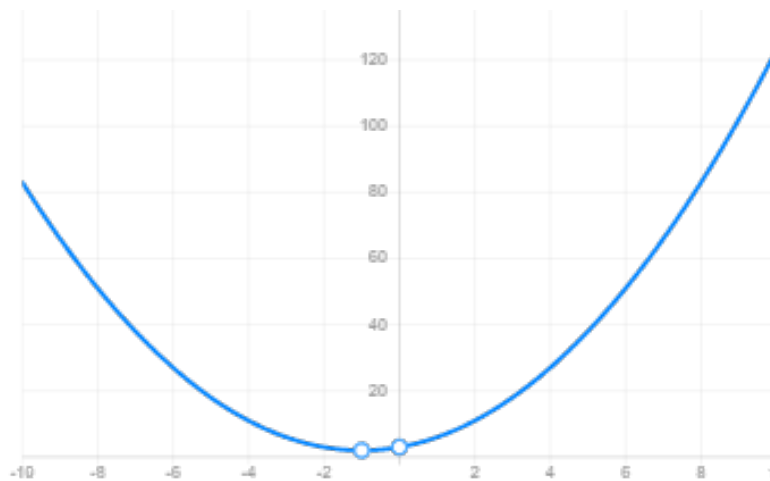
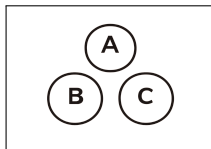


18 Functions and Graphs

Parabola / Quadratic

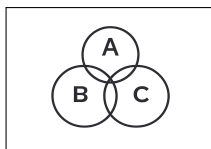
B



$$a = 1, b = 2, c = 3$$

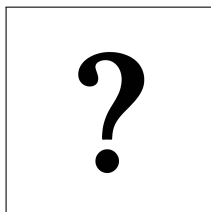
$$f(x) = x^2 + 2x + 3$$

$$v = (-1, 2)$$



$$y = ax^2 + bx + c$$

$$v = (-b/2a, f(-b/2a))$$



$$a = 10, b = 5, c = 15$$

$$f(x) = ?$$

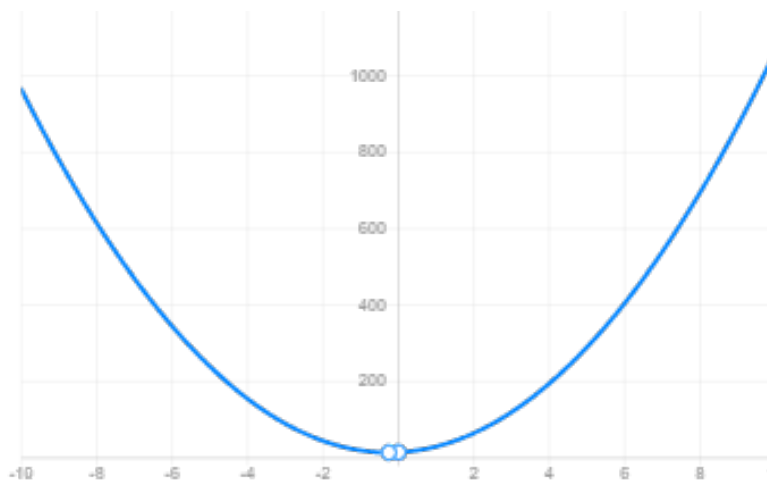
$$x = ?$$

$$v = ?$$

18 Functions and Graphs

Parabola / Quadratic

B



$$a = 10, b = 5, c = 15$$

$$f(x) = 10x^2 + 5x + 15$$

$$x = -\frac{b}{2a} = -\frac{5}{2(10)} = -\frac{5}{20} = -\frac{1}{4}$$

$$f\left(-\frac{1}{4}\right) = 10\left(-\frac{1}{4}\right)^2 + 5\left(-\frac{1}{4}\right) + 15$$

$$f\left(-\frac{1}{4}\right) = 10\left(\frac{1}{16}\right) - \frac{5}{4} + 15$$

$$f\left(-\frac{1}{4}\right) = \frac{10}{16} - \frac{5}{4} + 15$$

$$f\left(-\frac{1}{4}\right) = \frac{5}{8} - \frac{10}{8} + 15$$

$$f\left(-\frac{1}{4}\right) = -\frac{5}{8} + 15$$

$$f\left(-\frac{1}{4}\right) = \frac{115}{8}$$

$$v = \left(-\frac{1}{4}, \frac{115}{8}\right)$$

$$v = (-0.25, 14.375)$$