

Quadratic Functions

Let a , b and c be real numbers with $a \neq 0$.

$f(x) = ax^2 + bx + c$ is called a quadratic function.

$f(x) = a(x-h)^2 + k$ is the standard form of a quadratic function.

$$\underline{f(x) = ax^2 + bx + c}$$

$$\text{vertex: } (x, y) = \left(-\frac{b}{2a}, f\left(-\frac{b}{2a}\right) \right)$$

x -intercept: set $y = 0$

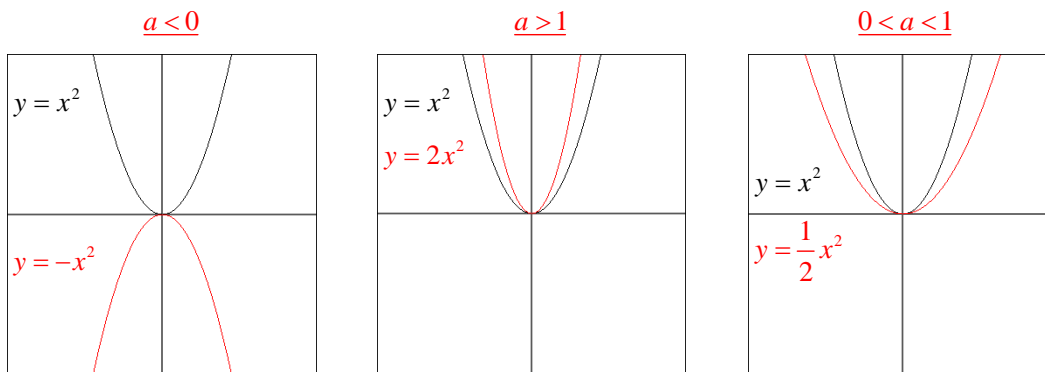
y -intercept: set $x = 0$

$$\underline{f(x) = a(x-h)^2 + k}$$

vertex: (h, k)

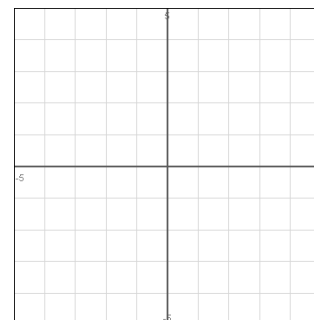
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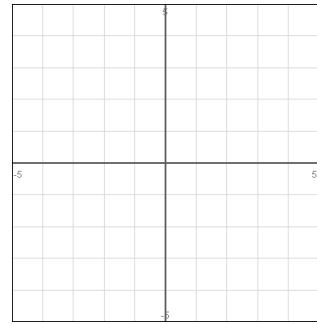


1. Sketch the graph of each quadratic function. Identify the vertex and the x and y intercepts.

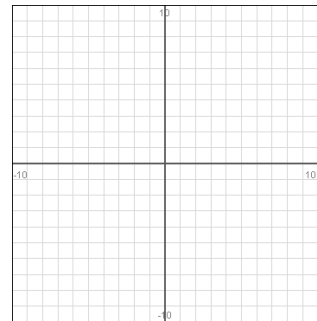
a) $f(x) = 2 - \frac{1}{4}x^2$



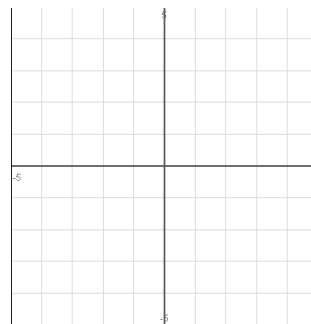
b) $f(x) = (x-1)^2 + 2$



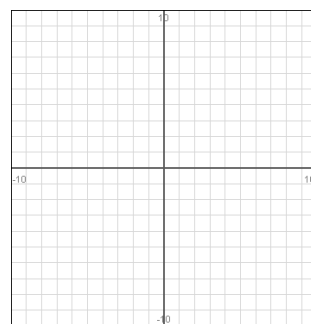
c) $f(x) = x^2 + 3x - 4$



d) $f(x) = -x^2 - 4x + 1$



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



2. Rewrite the quadratic function in standard form using the method of completing the square and then identify the vertex.

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

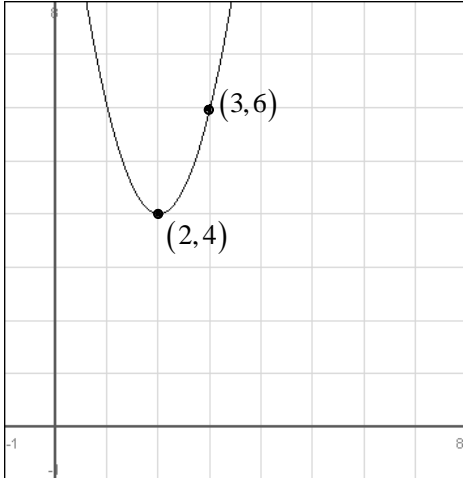
b) $f(x) = 4x^2 + 24x + 5$

c) $f(x) = x^2 + 3x + 5$

d) $f(x) = \frac{1}{2}(x^2 + x + 8)$

3. Find an equation for the parabola.

a)



b) Vertex: $\left(-\frac{1}{4}, \frac{3}{2}\right)$, Point: (-2, 1)