Answer on Question #54913 – Math – Algebra

Consider the following quadratic function.

$$f(x) = x^2 - 6x - 7$$

Find the x- and y-intercepts of the graph, if any exist. (If an answer does not exist, enter DNE.)
x-intercept (x, y) = (larger x value)
x-intercept (x,y)= (smaller x value)

Convert the function into standard form.
f(x) =

Graph the quadratic function.

Identify the vertex and the axis of symmetry.
vertex
(x, y) =

Solution

Find the x- and y-intercepts of the graph, if any exist. (If an answer does not exist, enter DNE.)

$$x^2 - 6x - 7 = 0 \to |D = 6^2 - 4 \cdot (-7) = 8^2| \to x_1 = \frac{6-8}{2} = -1, x_2 = \frac{6+8}{2} = 7$$

$$f(0) = 0^2 - 6 \cdot 0 - 7 = -7$$

Thus,

$$y - intercept\ is\ (x, y) = (0\,; -7)$$

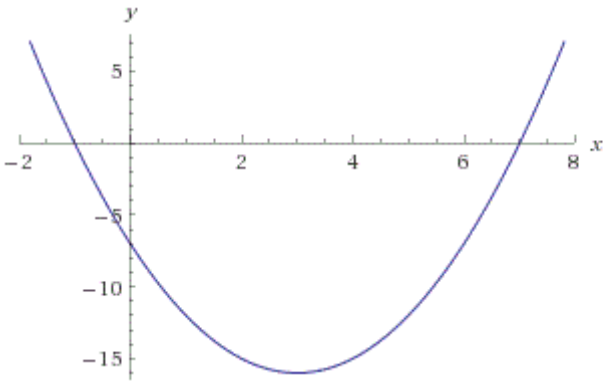
$$x - intercept\ (x, y) = (larger\ x\ value) = -1$$

$$x - intercept\ (x, y) = (smaller\ x\ value) = 7$$

Convert the function into standard form.

$$f(x) = x^2 - 6x + 9 - 9 + 7 = (x-3)^2 - 2$$

Graph the quadratic function.



Identify the vertex and the axis of symmetry.

vertex is

$$(x, y) = (3; -2)$$

axis of symmetry is

$$x = 3$$