

Graphing Quadratics

Subject: Algebra 2

Level: High School

Objective: Graphing of Quadratic Equations in
 $f(x)=ax^2+bx+c$ form

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Date:

$$y = \frac{1}{2}x^2 + 4x + 5$$

1. Label "a", "b", and "c"

$$y = ax^2 + bx + c \quad a = \frac{1}{2} \quad b = 4 \quad c = 5$$

2. Find the Axis of Symmetry

$$x = \frac{-b}{2a} \rightarrow x = \frac{-(4)}{2(\frac{1}{2})} = \frac{-4}{1} = -4$$

$x = -4$

3. Find the Vertex

$$\begin{aligned} x &= -4 \\ y &= -3 \\ (-4, -3) \end{aligned} \quad \begin{aligned} y &= \frac{1}{2}(-4)^2 + 4(-4) + 5 \\ &= \frac{1}{2}(16) + 4(-4) + 5 \\ &= 8 - 16 + 5 = -3 \end{aligned}$$

$$y = \frac{1}{2}x^2 + 4x + 5 \quad a = \frac{1}{2} \quad b = 4 \quad c = 5$$

4. Find the Y-Intercept

$$(0, c) \quad (0, 5)$$

Stop:

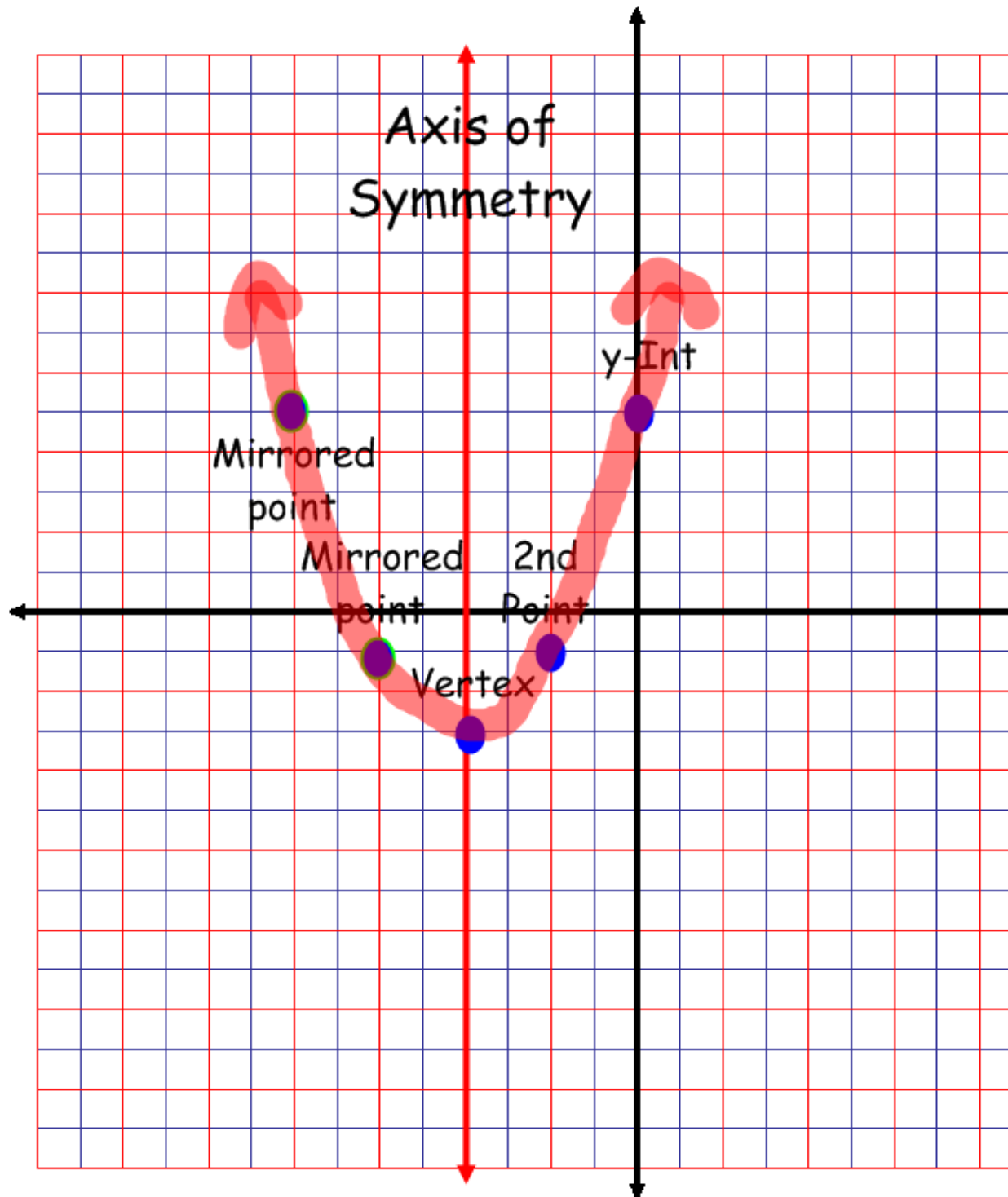
Now Graph the
information you have.

5. Find another point on the same side of the axis of symmetry as the y-intercept. If the vertex is the y-intercept find a second point

$$\begin{aligned} \text{use } x = -2 & \quad y = \frac{1}{2}(-2)^2 + 4(-2) + 5 \\ & \quad y = -1 \quad = \frac{1}{2}(4) + 4(-2) + 5 \end{aligned}$$

$$\begin{aligned} (-2, -1) & \quad = 2 - 8 + 5 \\ & \quad = -1 \end{aligned}$$

6. Mirror the two points over the axis of symmetry and graph the parabola



Axis of
Symmetry
 $x = -4$

Vertex
 $(-4, -3)$

y-Int
 $(0, 5)$

Second
Point
 $(-2, -1)$