Graph Quadratic Functions

Vertex Form

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

1) Find the Vertex

(h, k)

hint → h always opposite sign
k always same sign

2) Find axis of symmetry

$x = h$

3) Find two points on same side of the axis of symmetry

4) Mirror over the points

$$y = -\frac{1}{2}(x+3)^2 + 4$$

1) Vertex $\Rightarrow (h, k) \Rightarrow (-3, 4)$

2) AoS $\Rightarrow x = h \Rightarrow x = -3$

$x = -1 \Rightarrow (-1, 2)$

$y = -\frac{1}{2}(-1+3)^2 + 4$

$y = -\frac{1}{2}(2)^2 + 4$

$y = -\frac{1}{2}(4) + 4$

$y = -2 + 4 = 2$

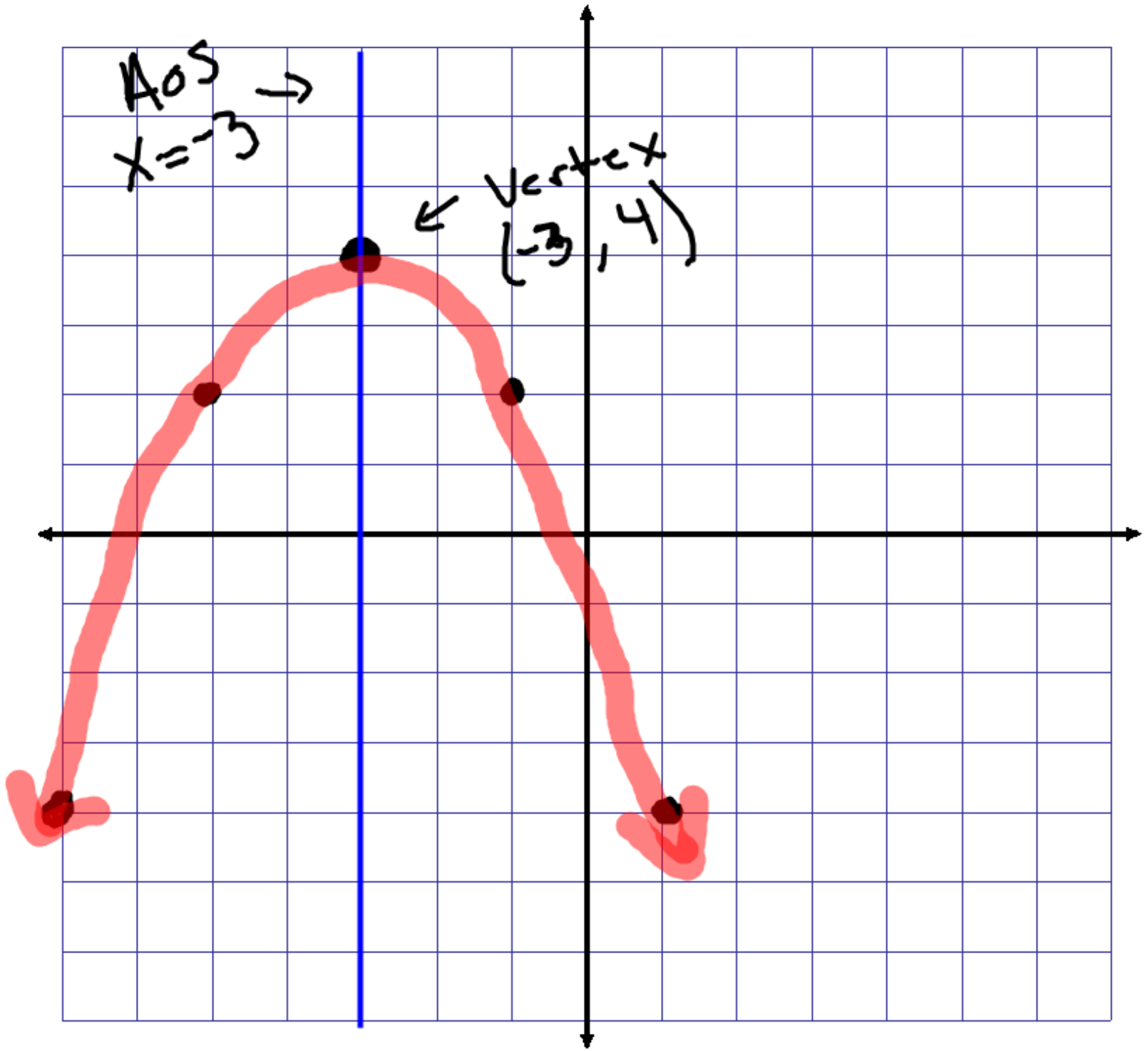
$x = 1 \Rightarrow (1, -4)$

$y = -\frac{1}{2}(1+3)^2 + 4$

$y = -\frac{1}{2}(4)^2 + 4$

$y = -\frac{1}{2}(16) + 4$

$y = -8 + 4 = -4$


AoS
x=-3
Vertex
(-3, 4)

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127-135 all

GRAPHING QUADRATIC FUNCTIONS **Graph the function.** (Review 5.1 for 5.3)

127. $y = x^2 - 2$

128. $y = 2x^2 - 5$

129. $y = -x^2 + 3$

130. $y = (x + 1)^2 - 4$

131. $y = -(x - 2)^2 + 1$

132. $y = -3(x + 3)^2 + 7$

133. $y = \frac{1}{4}x^2 - 1$

134. $y = \frac{1}{2}(x - 4)^2 - 6$

135. $y = -\frac{2}{3}(x + 1)(x - 3)$