

Name: Key

Date: _____

62 Vertex Form Equations

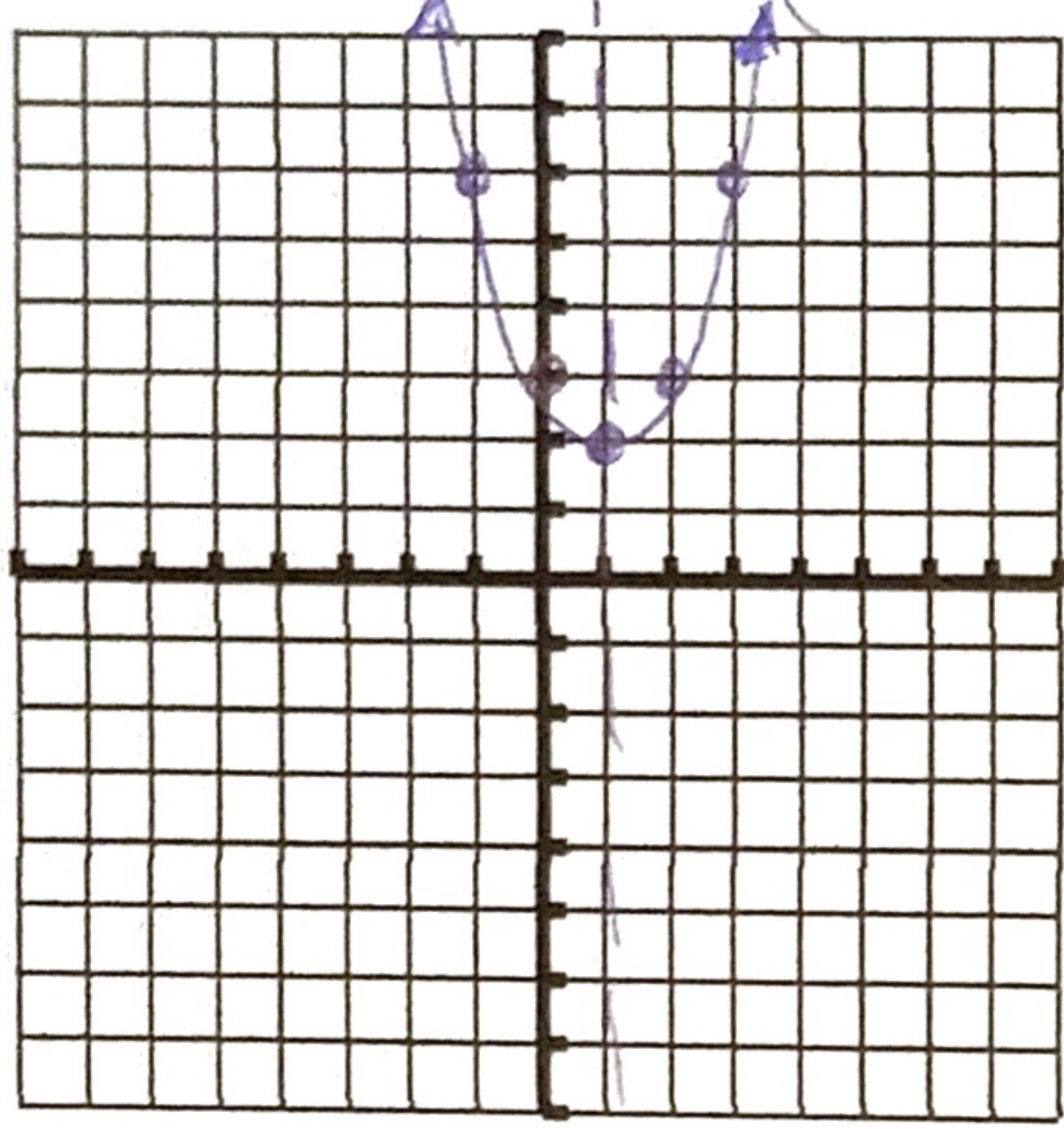
Graph each function.

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

Vertex = (1, 2)

A.O.S. = x=1

Is the vertex a max or min?



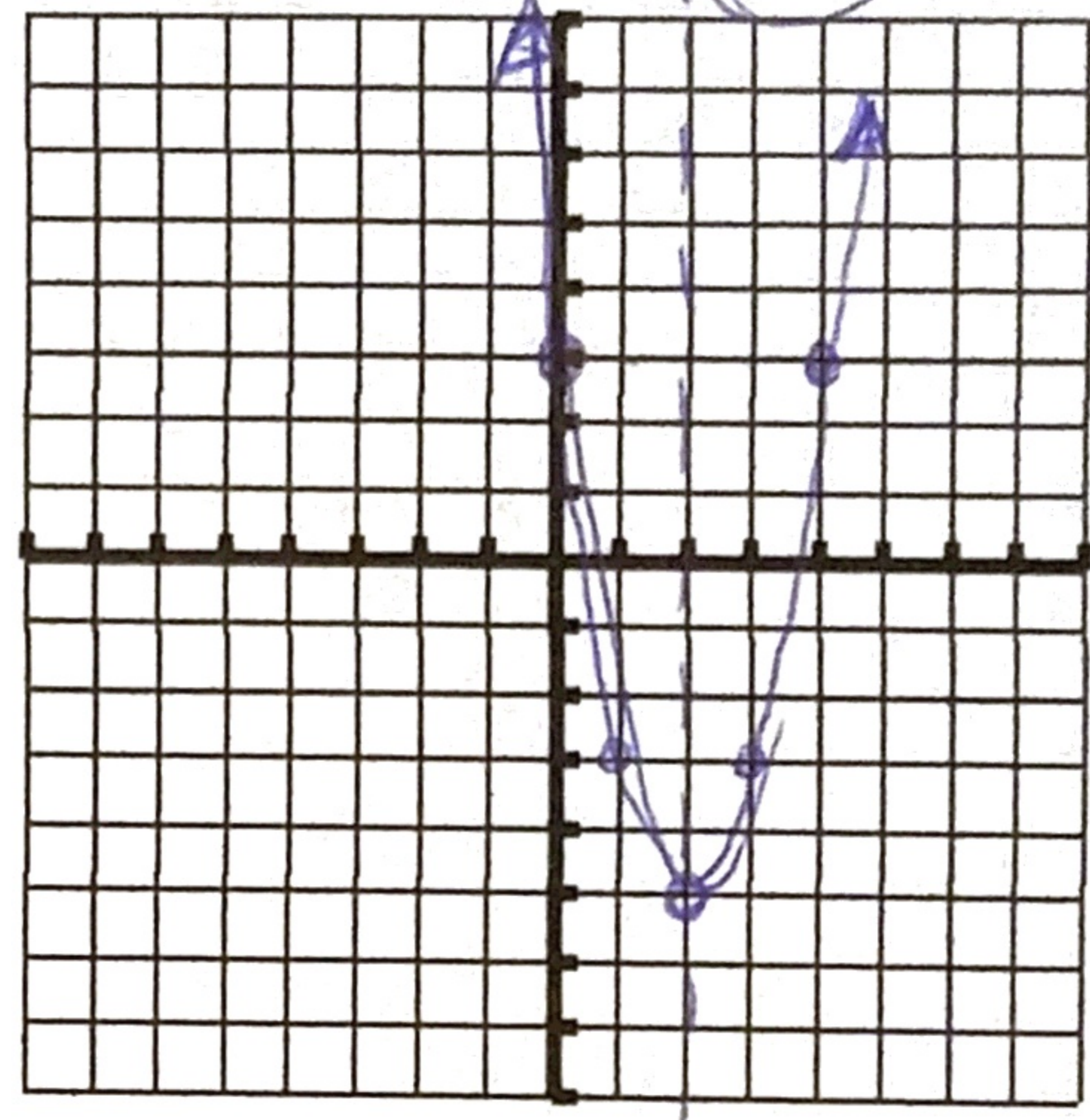
y-int (0, 3)
x=0
 $f(0) = (0-1)^2 + 2$
 $= (-1)^2 + 2$
 $= 1 + 2$
 $= 3$
additional pt (3, 6)
x=3
 $y = (3-1)^2 + 2$
 $y = 2^2 + 2$
 $y = 4 + 2$
 $y = 6$

2. $f(x) = 2(x-2)^2 - 5$

Vertex = (2, -5)

A.O.S. = x=2

Is the vertex a max or min?

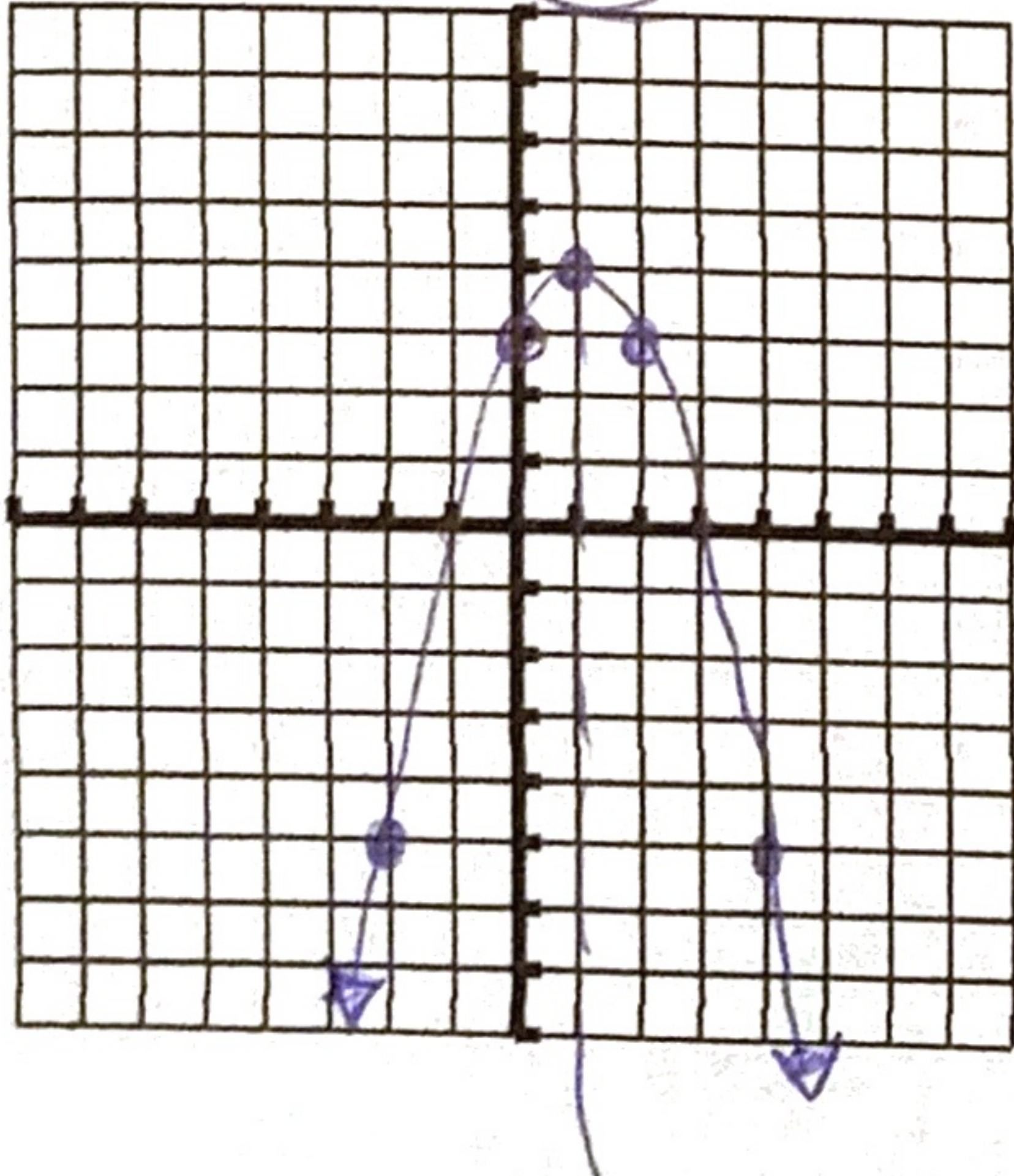


y-int (0, 3)
x=0
 $y = 2(0-2)^2 - 5$
 $y = 2(-2)^2 - 5$
 $y = 2(4) - 5$
 $y = 8 - 5$
 $y = 3$
additional pt (1, -3)
x=1
 $y = 2(1-2)^2 - 5$
 $y = 2(-1)^2 - 5$
 $y = 2(1) - 5$
 $y = 2 - 5$
 $y = -3$

3. $h(x) = -(x-1)^2 + 4$

Vertex = (1, 4) A.O.S. = x=1

Is the vertex a max or min?

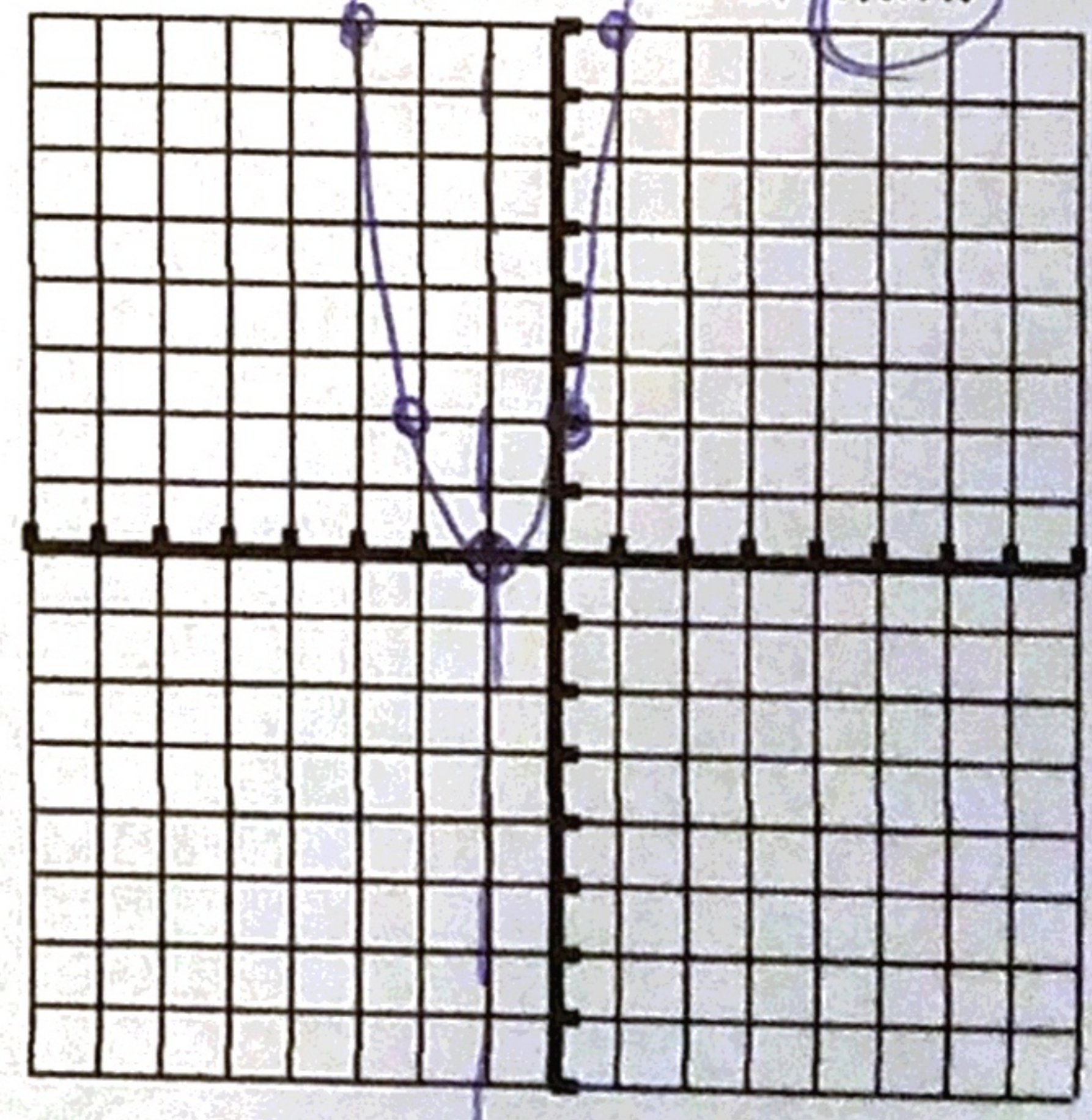


y-int (0, 3)
x=0
 $h(0) = -(0-1)^2 + 4$
 $= -(-1)^2 + 4$
 $= -1 + 4$
 $= 3$
additional pt (4, -5)
x=4
 $h(4) = -(4-1)^2 + 4$
 $= -(3)^2 + 4$
 $= -9 + 4$
 $= -5$

4. $f(x) = 2(x+1)^2$

Vertex = (-1, 0) A.O.S. = x=-1

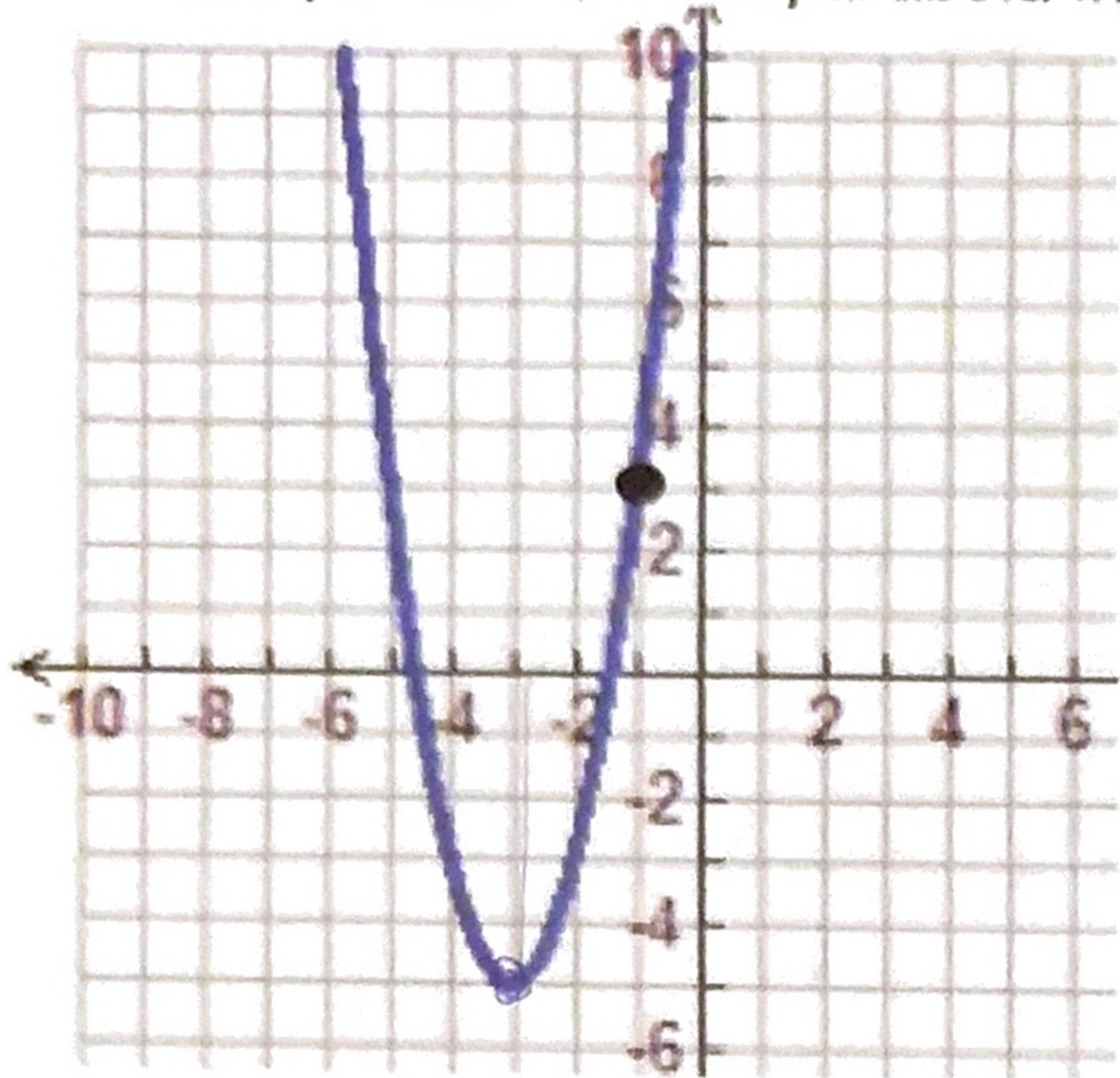
Is the vertex a max or min?



y-int (0, 2)
 $f(0) = 2(0+1)^2$
 $= 2(1)^2$
 $= 2 \cdot 1$
 $= 2$
additional pt (1, 8)
x=1
 $f(1) = 2(1+1)^2$
 $= 2(2)^2$
 $= 2 \cdot 4$
 $= 8$

Write the equation of each parabola in vertex form. Show all work to find a.

5.



vertex $(-3, -5)$ through $(-1, 3)$

$$f(x) = a(x-h) + k$$

$$f(x) = a(x+3)^2 - 5$$

$$3 = a(-1+3)^2 - 5$$

$$3 = a(2)^2 - 5$$

$$3 = 4a - 5$$

$$\begin{array}{r} +5 \\ 8 = 4a \end{array}$$

$$\frac{8}{4} = \frac{4a}{4}$$

$$2 = a$$

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

6. A quadratic has vertex at $(-2, 0)$ and goes through the point $(4, 10)$

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

$$f(x) = a(x+2)^2 + 0$$

$$10 = a(4+2)^2$$

$$10 = a(6)^2$$

$$\frac{10}{36} = \frac{36a}{36}$$

$$a = \frac{5}{18}$$

$$f(x) = \frac{5}{18}(x+2)^2$$

7. Write the equation of javelin throw #3.

vertex $(20, 12)$ through $(0, 6)$

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

$$f(x) = a(x-20)^2 + 12$$

$$6 = a(0-20)^2 + 12$$

$$6 = a(-20)^2 + 12$$

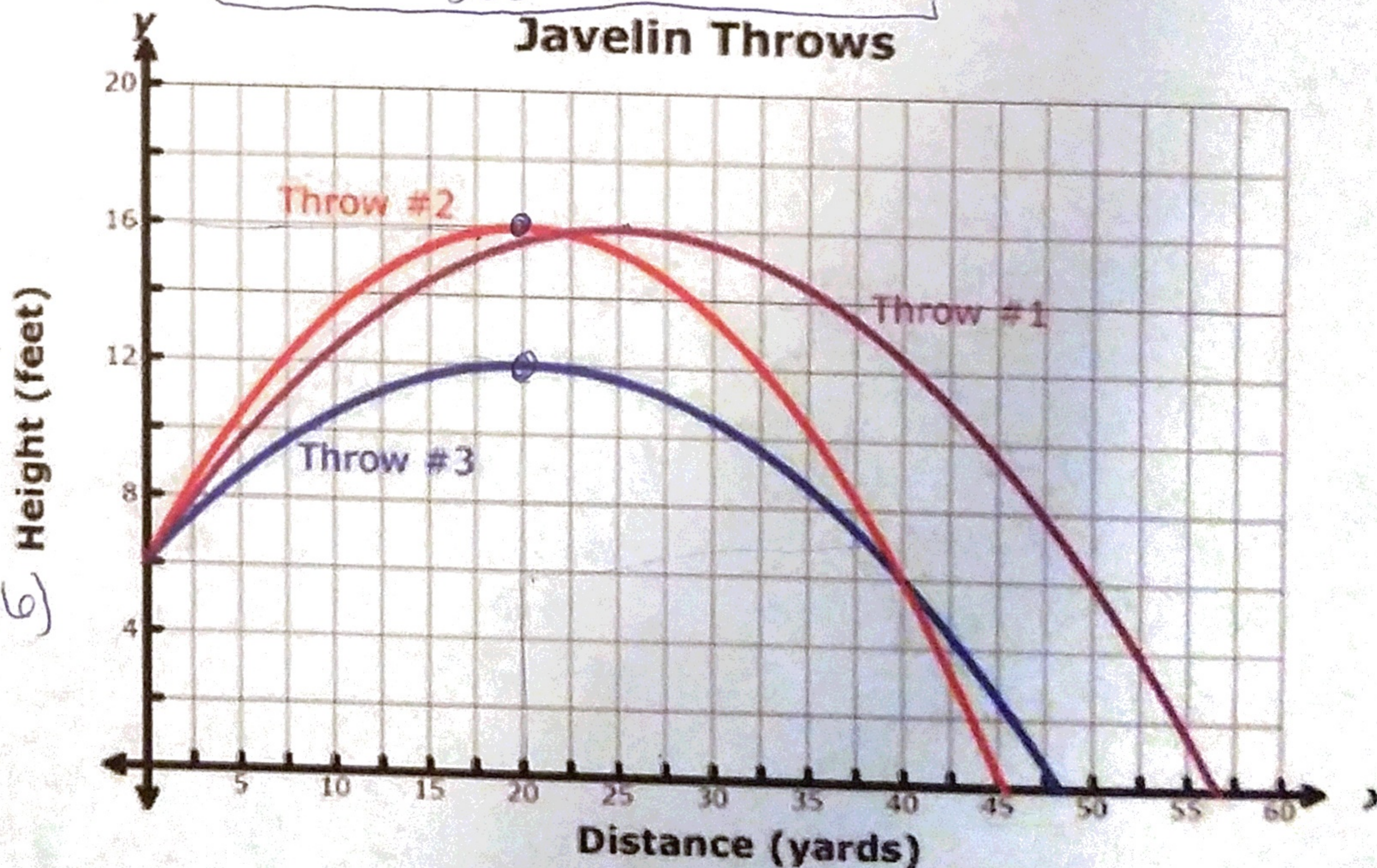
$$\begin{array}{r} -12 \\ -6 = a(400) \end{array}$$

$$\frac{-6}{400} = \frac{400a}{400}$$

$$-\frac{3}{200} = a$$

$$f(x) = -\frac{3}{200}(x-20)^2 + 12$$

Javelin Throws



8. The equation of javelin throw #2.

vertex $(20, 16)$ through $(0, 6)$

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

$$f(x) = a(x-20)^2 + 16$$

$$6 = a(0-20)^2 + 16$$

$$6 = a(-20)^2 + 16$$

$$\begin{array}{r} -16 \\ -10 = 400a \end{array}$$

$$\frac{-10}{400} = \frac{400a}{400}$$

$$a = -\frac{1}{40}$$

$$g(x) = -\frac{1}{40}(x-20)^2 + 16$$