

Warm Up

Find the value for the function $f(x) = 2x^2 - 6x + 4$

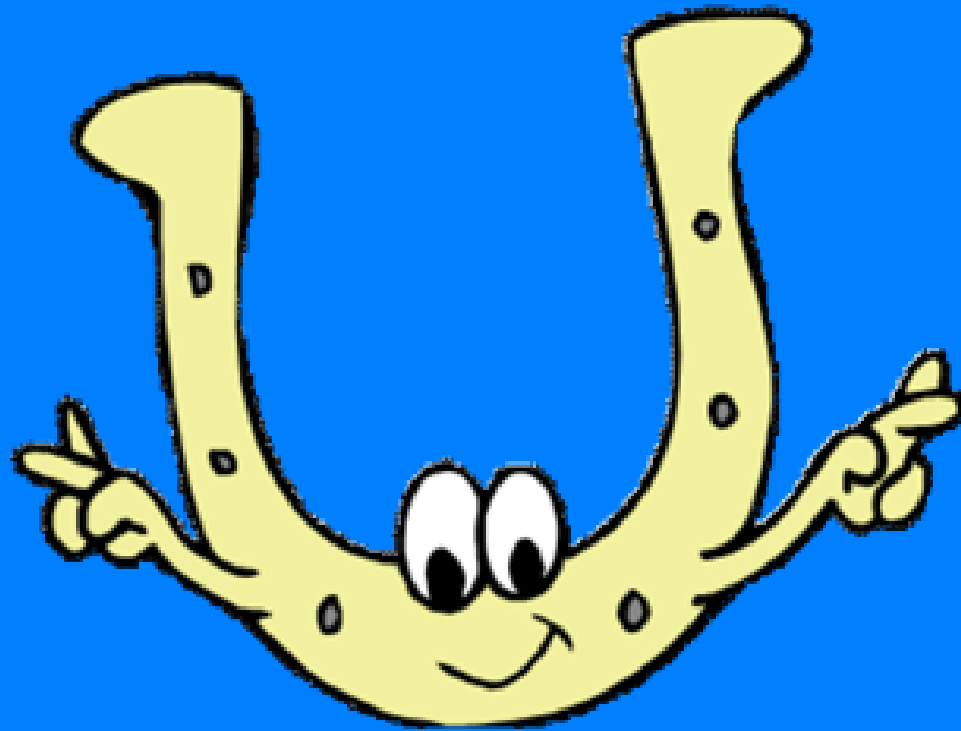
1. $f(2)$

$$\begin{aligned} & 2(2)^2 - 6(2) + 4 \\ & 2(4) - 12 + 4 \\ & 8 - 12 + 4 = 0 \end{aligned}$$

2. $f(-3)$

$$\begin{aligned} & 2(-3)^2 - 6(-3) + 4 \\ & 2(9) + 18 + 4 \\ & 18 + 18 + 4 = 40 \end{aligned}$$

Graphing and Solving Quadratics



State Standards

You will identify the vertex, axis of symmetry, max or min, y-intercept, zeros, and domain and range of a parabola.

You will use technology to graph the parabola.

You will use $y=$ and $f(x)$ notation for graphs.

Quadratic Function

$$y = ax^2 + bx + c$$

$$a \neq 0$$

a = quadratic term

b = linear term

c = constant

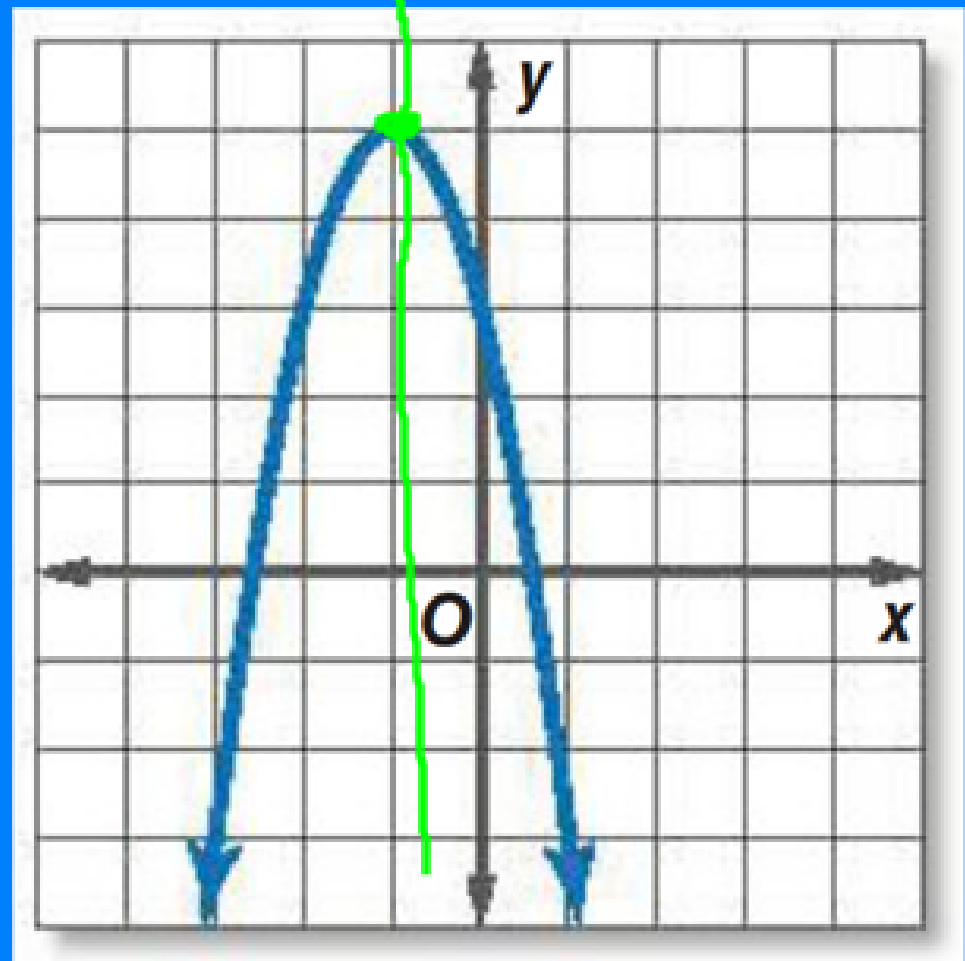
Quadratic Function

Graph is a **parabola**.



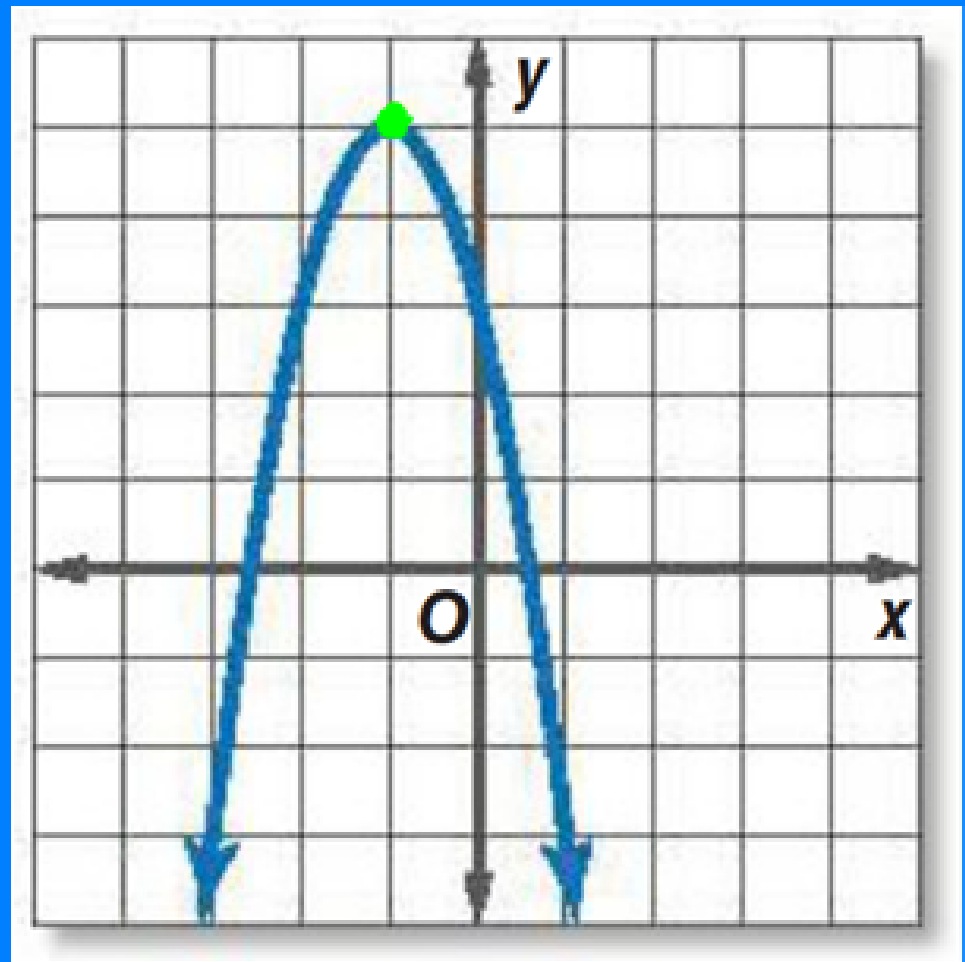
Quadratic Function

All parabolas have an **axis of symmetry**.



Quadratic Function

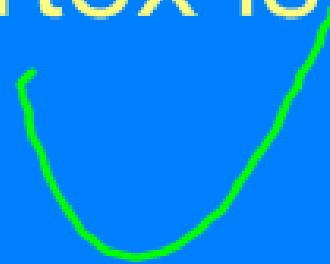
The point at which the axis of symmetry intersects a parabola is the **vertex**.



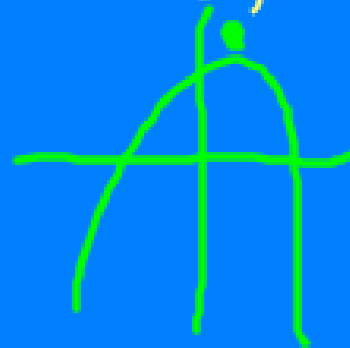
Quadratic Function

Max or Min

If a is positive, vertex is
a min.



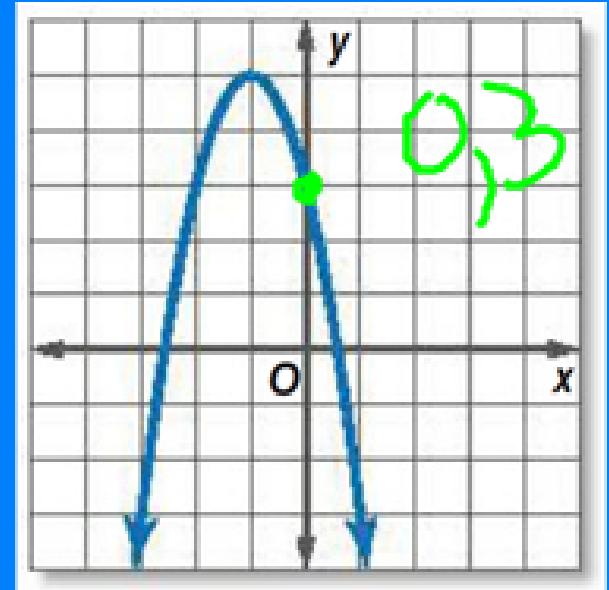
If a is negative, vertex is
a max.



Quadratic Function

y- intercept

where the parabola crosses
the y-axis



Quadratic Function

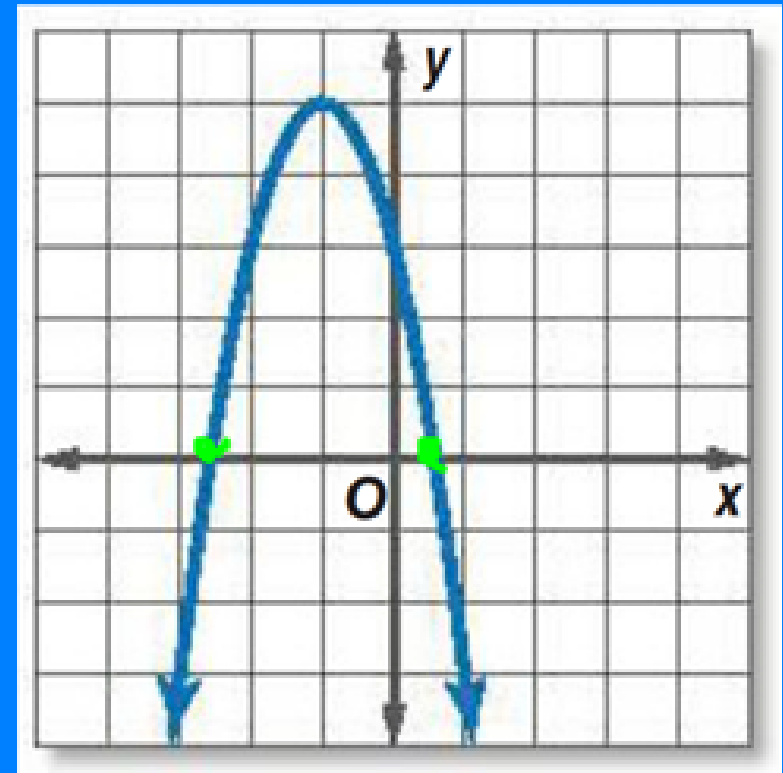
Solutions:

Zeros

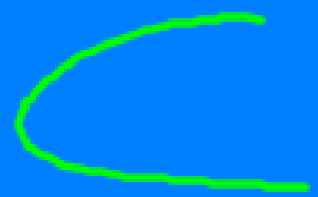
Roots

Answers

X - intercepts



*Where the graph crosses the x-axis



Quadratic Function

Domain: What x's are being used?

x value

Range: What y's are being used?

y value

Find the:

vertex $(0, 5)$ $x=0$

axis of symmetry

max: or min

y-intercept

zeros -1.5 $+1.5$

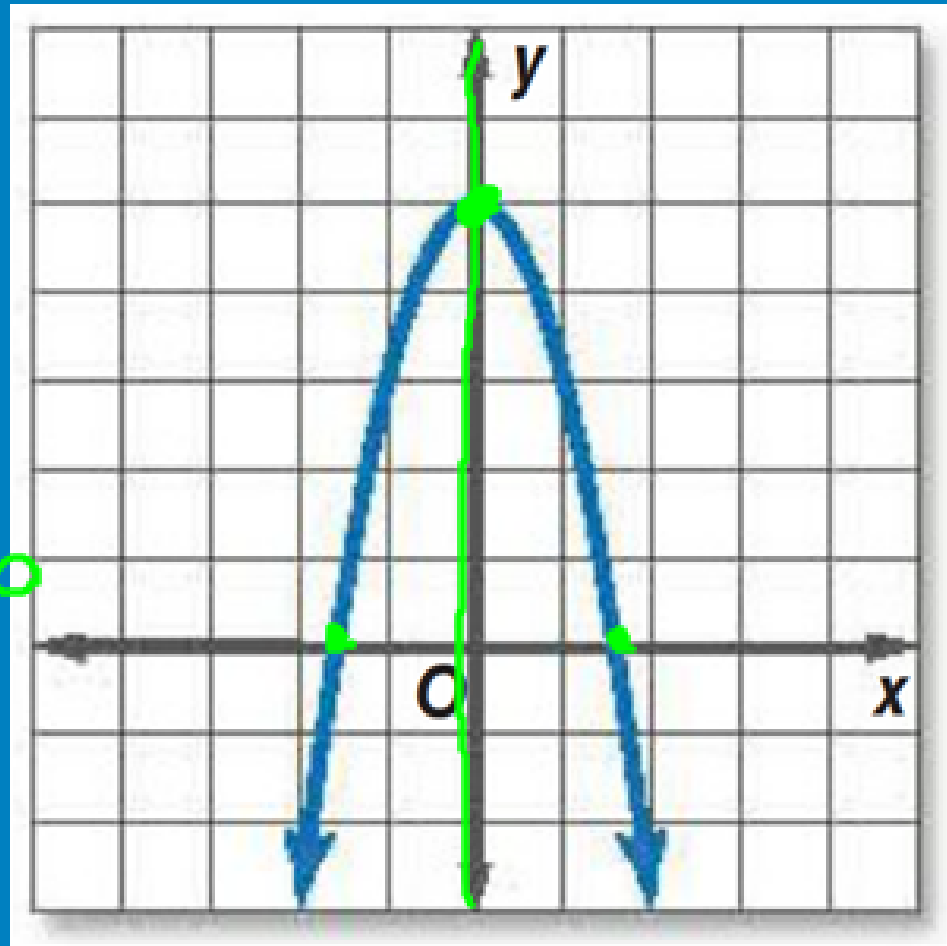
domain $-\infty$ $+\infty$

range

all real #'s

5 $-\infty$

$\{y \mid y \leq 5\}$



Question 2:

Find the:

vertex $(-2, -3)$

axis of symmetry $x = -2$

max or min

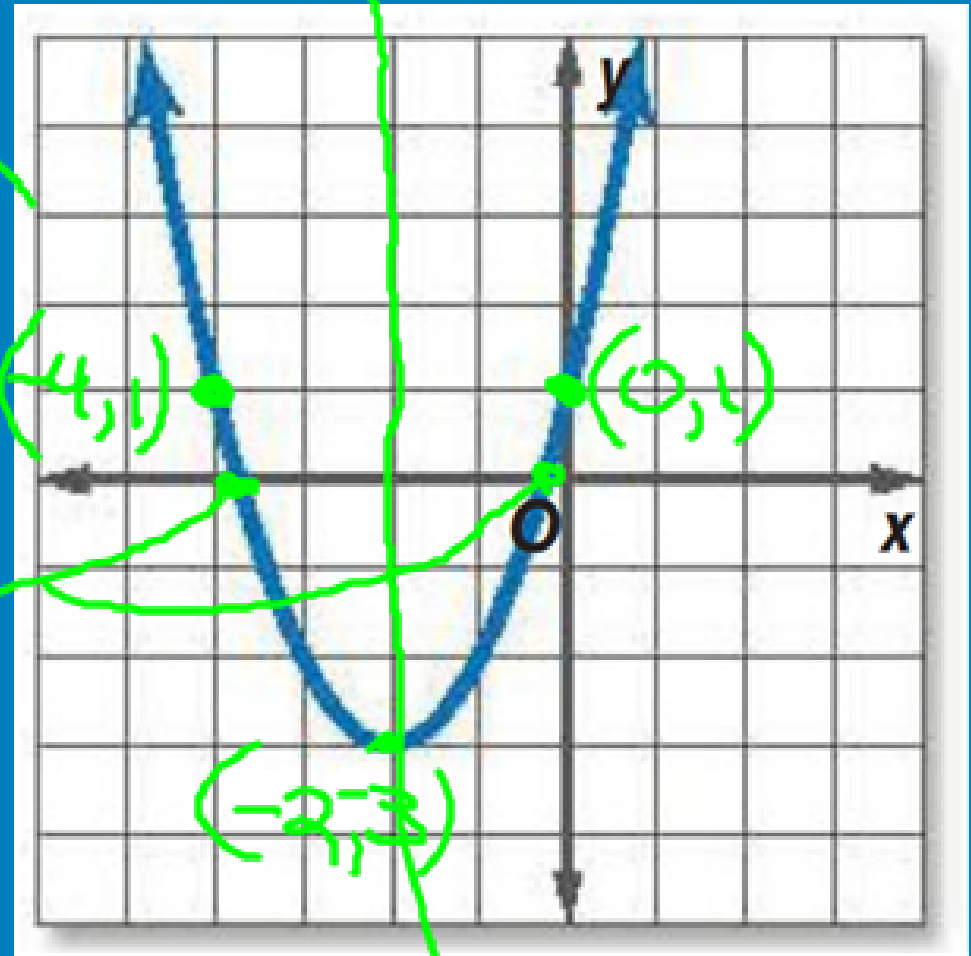
y-intercept $(0, 1)$

zeros

domain $-\infty, \infty$

range all real #'s

$\{y \mid y \geq -3\}$



Find the:

$$y = x^2 - 4x + 4$$

vertex $(2, 0)$

axis of symmetry $x = 2$

max or min

y-intercept $(0, 4)$

zeros $(2, 0)$

domain all Real #'s

range

$\{y \mid y \geq 0\}$



Find the:

vertex

$(3, -4)$

axis of symmetry

$x=3$

max or min

y-intercept

$(0, 5)$

zeros

$(1, 0)$ $(5, 0)$

domain

all Real #'s

range

$\{y \mid y \geq -4\}$

$$y = x^2 - 6x + 5$$

