Warmup

- 1.) $x^2 = 45$ 2.) $\sqrt{\frac{15}{4}}$

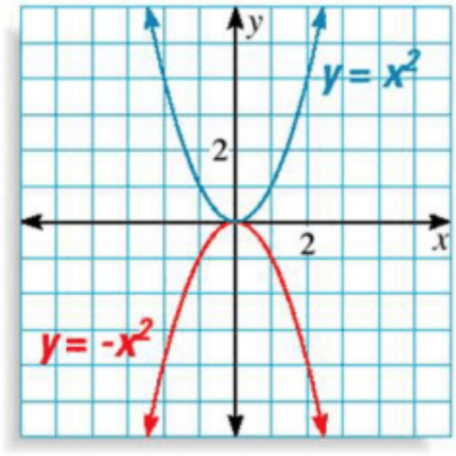
CHAPTER 9
SECTION 3

Graphing Quadratic Functions

Quadratic Function

- Standard Form: $y = ax^2 + bx + c$, where $a \neq 0$

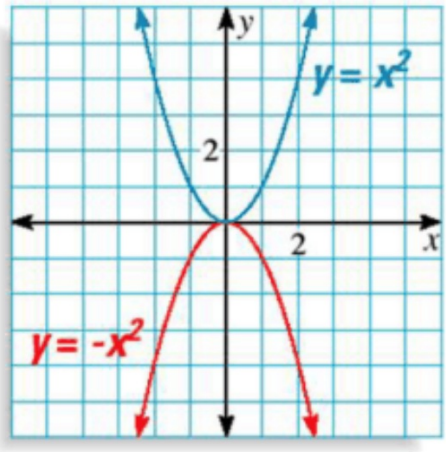
- The graph looks like a U which is called a parabola.



Quadratic Function

- Vertex: the highest or lowest point on the graph (point where graph changes)

- Axis of Symmetry: vertical line through the vertex



Find the Vertex

- The x coordinate of the vertex is $x = \frac{-b}{2a}$
- To find the y coordinate, plug in the x value and solve for y

Examples:

ax^2+bx+c

1. $2x^2-12x+1$

$a=2$

$b=-12$

$x=\frac{-b}{2a}$

$x=\frac{12}{2\cdot 2}$

$x=3$

$y=2(3)^2-12(3)+1$

$y=18-36+1$

$y=-17$

$V(3,-17)$

2. $-4x^2+2x+6$

$a=-4$

$b=2$

$x=\frac{-b}{2a}=\frac{-2}{2(-4)}=\frac{-2}{-8}$

$x=.25$

$y=-4(.25)^2+2(.25)+6$

$y=-.25+.5+6$

$y=6.25$

$V(.25,6.25)$

Example:

- 3. $y = x^2 - 5x + 3$

$a = 1$

$b = -5$

$x = \frac{-b}{2a}$

$x = \frac{5}{2 \cdot 1}$

$x = 2.5$

$y = (2.5)^2 - 5(2.5) + 3$

$6.25 - 12.5 + 3$

$y = -3.25$

$(2.5, -3.25)$

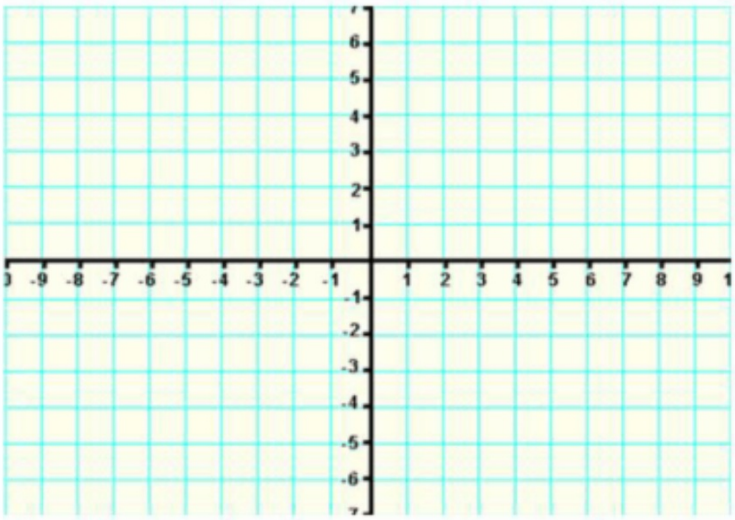
Graphing a Quadratic Function

- Steps:
  - Find and plot the vertex
  - Find two points to the left and two points to the right of the vertex
  - Draw the curve
  - Use axis of symmetry to check graph

Example:

- 1. $y = x^2 - 2x - 3$

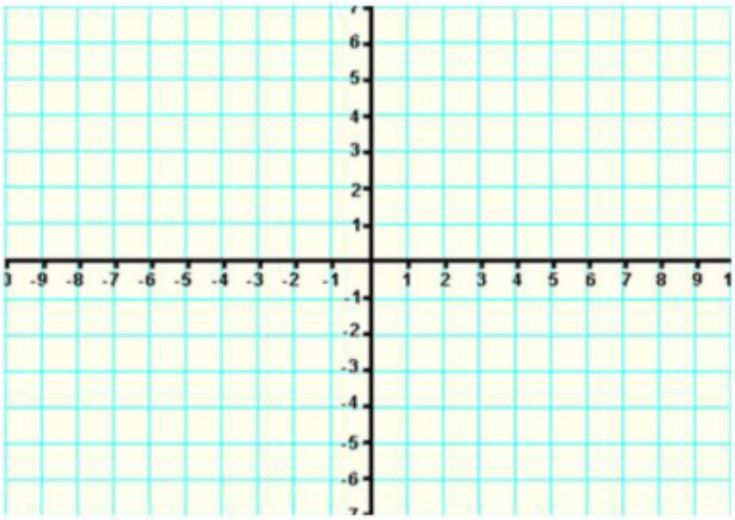
X	Y	Work



Example

- 2. $y = -2x^2 + 4x + 1$

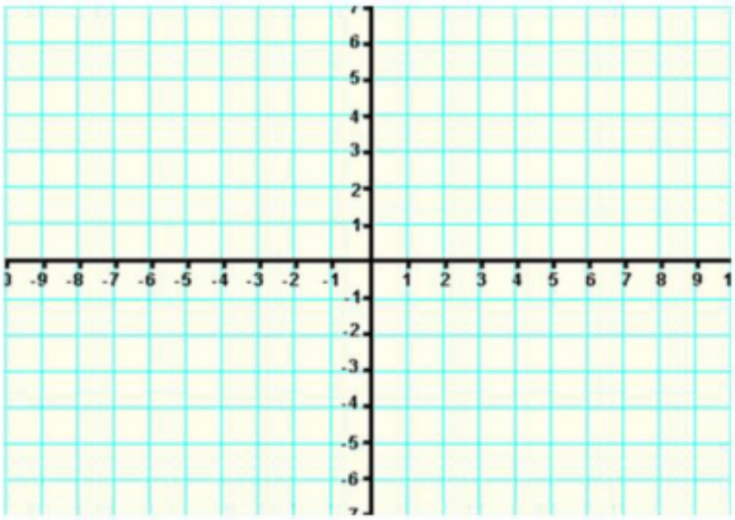
X	Y	Work



Example:

- 3. $y = x^2 + 4x - 1$

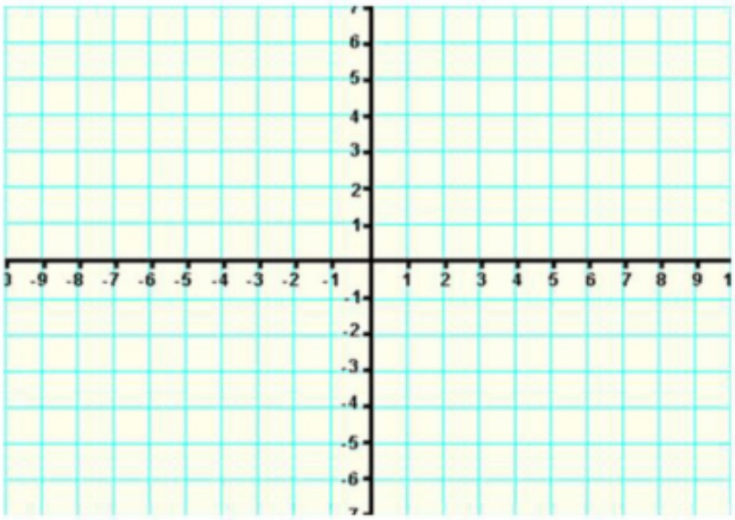
X	Y	Work



Example:

- 4. $y = -x^2 + 2x - 5$

X	Y	Work



Class Work

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Homework

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