

Warm up

Week 2

Simplify (no decimals)

$$1. \frac{18 \cdot \sqrt{3}}{\sqrt{3} \sqrt{3}} = \frac{18\sqrt{3}}{\sqrt{9}}$$

$$\frac{18\sqrt{3}}{3} = \textcircled{6\sqrt{3}}$$

$$3. 4\sqrt{\frac{16}{5}} = \frac{4\sqrt{16}}{\sqrt{5}}$$

$$\frac{4 \cdot 4}{\sqrt{5}} = \frac{16 \cdot \sqrt{5}}{\sqrt{5} \sqrt{5}} = \textcircled{\frac{16\sqrt{5}}{5}}$$

$$2. \frac{1}{2} \sqrt{32} \cdot \sqrt{2}$$

$$= \frac{1}{2} \sqrt{64} = \frac{1}{2} (8) = \textcircled{4}$$

$$4. \sqrt{2} \cdot \sqrt{8}$$

$$= \sqrt{16} = \textcircled{4}$$

### Homework Questions?

## Self Scoring Scale

4- I can *summarize* the concepts and explain it to others.

3- I can *apply* the concepts to answer questions correctly.

2- I can *apply* the concepts but with some *mistakes*.

1- I *need help* to know how to apply the concepts.

0- I *can't* apply the concepts even with help.

## Vocab Quiz

Out of 15 pts

A - 13.5

B - 12

C - 10.5

D - 9

# 9.3 Graphing Quadratic Functions

- Goals:**
- Sketch the graph of a quadratic function.
  - Use quadratic models in real-life settings.

**EQ:** What is the standard form of a quadratic function and what do you know from it?

<p>② LAST UNIT/Experience <b>Exponents</b></p>	<p>① CURRENT UNIT <b>Quadratic Equations</b></p>	<p>③ NEXT UNIT/Experience <b>Factoring</b></p>
<p>⑧ Student Activities or Assignments</p>	<p>⑤ UNIT MAP</p>	
<p>⑦ UNIT SELF-TEST QUESTIONS</p>	<ol style="list-style-type: none"> <li>1. How can you solve a quadratic equation by using square roots?</li> <li>2. How do you simplify radical expressions?</li> <li>3. What steps are necessary to graph a quadratic equation?</li> <li>4. How is the quadratic formula used to solve a quadratic equation?</li> <li>5. How is the discriminant found and what information does it tell you?</li> </ol>	<p>⑥ UNIT RELATIONSHIPS</p> <p>Solve Simplify Graph Compare.</p>

## Vocabulary

**Quadratic function in standard form:**

$$\underbrace{A}x^2 + \underbrace{B}x + \underbrace{C} = 0, \quad A \neq 0$$


Numbers

**Parabola:** U-shaped graph of a quadratic equation



**Vertex of a parabola:**

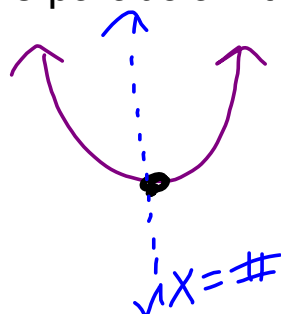
 minimum point (if opens up)

 maximum point  
(if opens down)

$$x = \frac{-b}{2a} \quad y = \text{"plug in } x\text{-value to original"} \quad y = ax^2 + bx + c \quad (x, y)$$

**Axis of symmetry of a parabola:**  $x = \#$

Line (vertical) passing through the vertex that divides the parabola into 2 symmetric parts



**GRAPH OF A QUADRATIC FUNCTION**

The graph of  $y = ax^2 + bx + c$  is a Parabola.

- If  $a$  is positive, the parabola opens UP  
 $a > 0$
- If  $a$  is negative, the parabola opens Down  
 $a < 0$
- The Vertex has an x-coordinate of  $-\frac{b}{2a}$ .  $= \frac{-b}{2a}$
- The Axis of Sym. is the vertical line  $x = -\frac{b}{2a}$ .

**Example 1: Graphing a Quadratic Function**

Sketch the graph of  $y = x^2 - 4x + 4$ .

Find the x-coordinate of the vertex when  $a = 1$  and  $b = -4$   
 $c = 4$

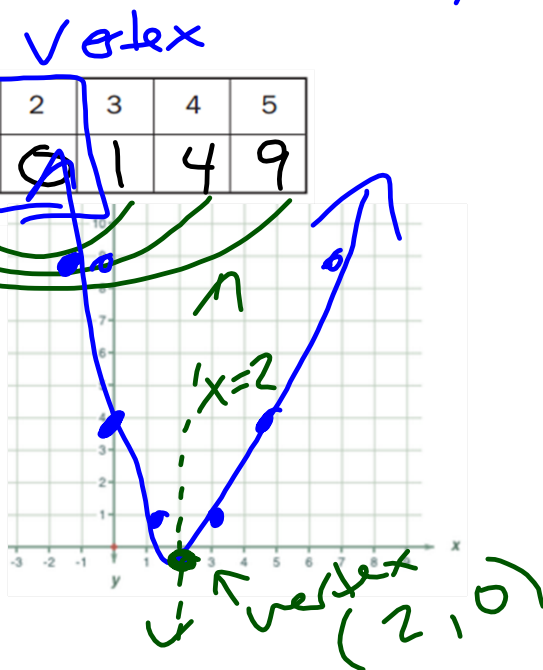
$x = \frac{b}{2a} = \frac{-(-4)}{2(1)} = \frac{4}{2} = 2$

Make a table of values, using x-values to the left and right of  $x = 2$

x	-1	0	1	2	3	4	5
y	9	4	1	0	1	4	9

Plot the points. The vertex is  $(2, 0)$  and the axis of symmetry is  $x = 2$ . Connect the points to form a parabola that opens up because  $a$  is pos..

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



### Example 2: Graphing a Quadratic Function

Sketch the graph of  $y = -x^2 + 2x - 1$ .

$a = -1, b = 2, c = -1$

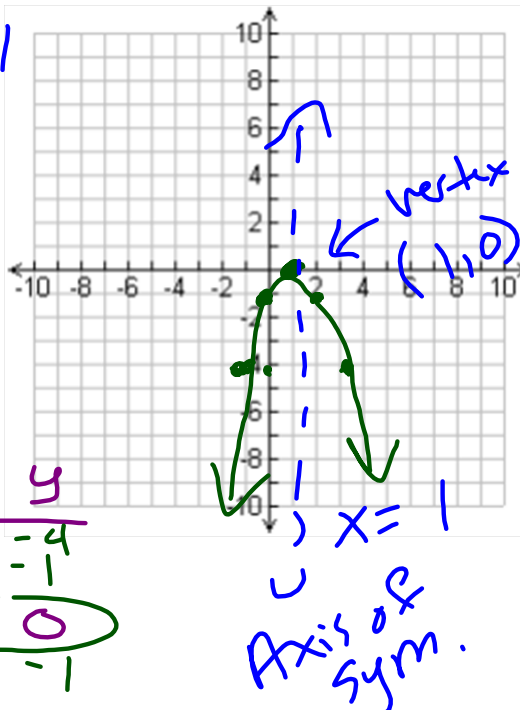
vertex:  $x = \frac{-b}{2a}$

$x = \frac{-(2)}{2(-1)} = \frac{-2}{-2}$

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

vertex  $(1, 0)$   
 $y = -1 + 2 - 1$   
 $y = 0$

x	y
-1	-4
0	-1
1	0
2	-1
3	-4



**Try It** Tell whether the graph opens up or down.  
 Write an equation of the axis of symmetry.

1)  $y = -x^2 - x + 1$

$a = -1, b = -1, c = 1$

**Down**  $b/c a$  is negative

Axis of Sym  $x = -\frac{1}{2}$

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

$x = \frac{-(-1)}{2(-1)} = \frac{1}{-2}$

2)  $y = 3x^2 - 2x + 2$

$a = 3, b = -2, c = 2$

**Up**

Axis of Sym

$x = \frac{-b}{2a} = \frac{-(-2)}{2(3)}$

$x = \frac{2}{2(3)} = \frac{2}{6} = \frac{1}{3}$

# Homework

9.3 Practice A wkst

(Show work on back or separate sheet)

\*Skip #24-32