Warm-Up

1) How many and what type of solutions does the following equation have:

$$-16m^2 + 6m - 3 = 6 - 8m^2$$

Solve each of the following using the quadratic formula:

$$\frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

2) $2n^2 + 11 = 12n$

3) $v^2 + 4 = 13$

Answers to Homework #8

1) -12; two imaginary solutions

2) 196; two real solutions

3) $\left\{5, -\frac{5}{3}\right\}$

4) $\left\{3, -\frac{4}{5}\right\}$

5) $\left\{\frac{-5+\sqrt{65}}{10}, \frac{-5-\sqrt{65}}{10}\right\}$

6) $\left\{\frac{1+\sqrt{13}}{4}, \frac{1-\sqrt{13}}{4}\right\}$

7) $\left\{\frac{5+2i\sqrt{5}}{5}, \frac{5-2i\sqrt{5}}{5}\right\}$

8) $\{9, -9\}$

9) $\left\{\sqrt{41}, -\sqrt{41}\right\}$

10) $\left\{\frac{7}{2}, -\frac{3}{2}\right\}$

Objective

Today we will:

- Graph Quadratic Functions
- Identify and label parts of the graph

Agenda:

- Notes/Examples
- Practice Graphing
- Lesson Check
- Independent Practice/Questions

What is a parent graph?

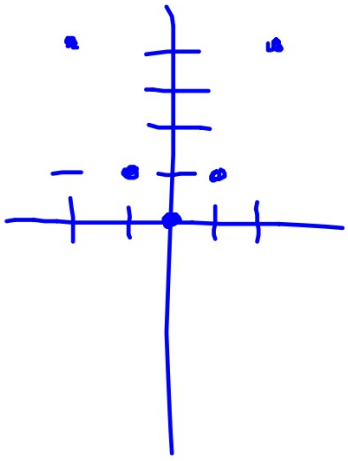
What can the vertex also be referred to as?

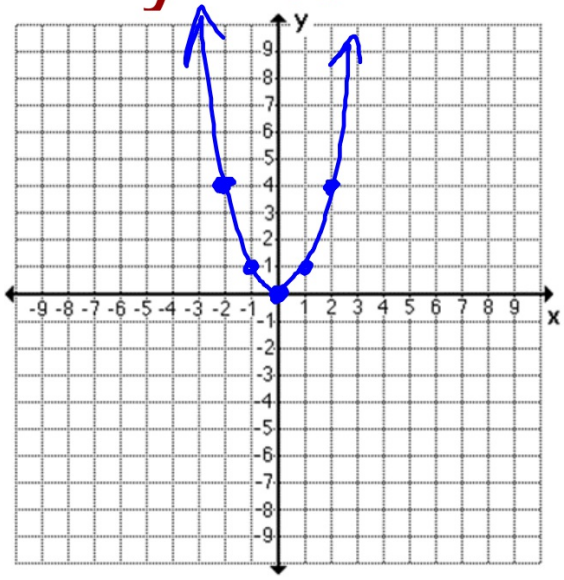
How does the AOS help make graphing easier?

What is the relation between zeros and X-Intercepts?

Quadratic Parent Graph

$y = x^2$





(0,0)
(1,1)
(-1,1)
(2,4)
(-2,4)

Graphing Quadratic Functions

Parts we need:

- Vertex
- Axis of Symmetry (AOS)
- Direction
- Y-Intercept
- Other Points
- X-Intercepts

Example 1:

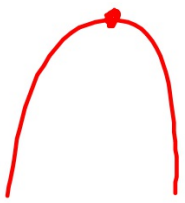
$f(x) = x^2 - 8x + 15$

Vertex:

$$\left(\frac{-b}{2a}, f\left(x\right) \right)$$

x y

- Vertex is either the lowest point, minimum or the highest point, maximum



Axis of Symmetry (AOS)

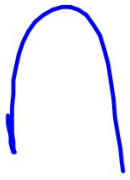
$$x = \frac{-b}{2a}$$

- Vertical Line that goes through the vertex and cuts the parabola in half

Direction: Up or Down?

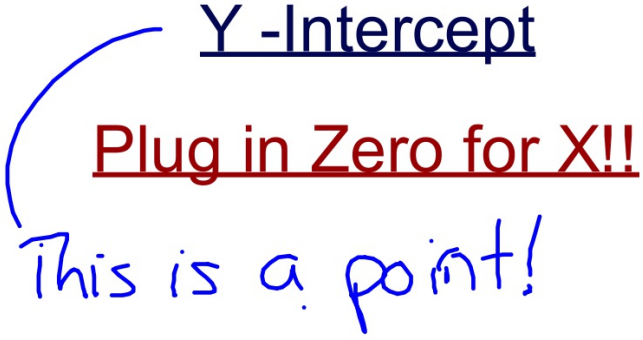
Up: Positive a value

Down: Negative a value



Y -Intercept

Plug in Zero for X!!



Other Points

- Set up a table
- Use X values near vertex
- Remember graph is symmetrical!

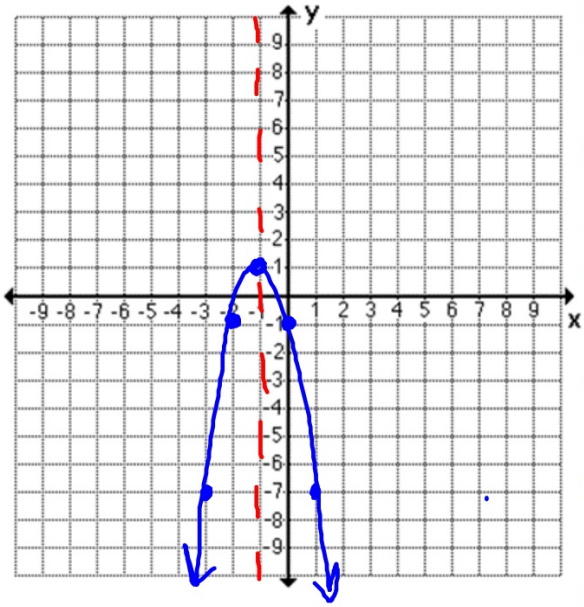
$x = 7$ $\{7, -3\}$ X-Intercepts $(7, 0)$
$x = -3$ $(-3, 0)$

- Related to Solutions (Solution , 0)
- Use full Coordinate
- Complex Quadratics have solutions but no X-Intercepts

$x = \frac{3 \pm 2i}{5}$: Solutions

None: X-Int

Example 2: $f(x) = -2x^2 - 4x - 1$



Vertex: $\frac{-b}{2a} = \frac{4}{-4} = (-1, 1)$

AOS: $x = -1$

Y-Int: $(0, -1)$

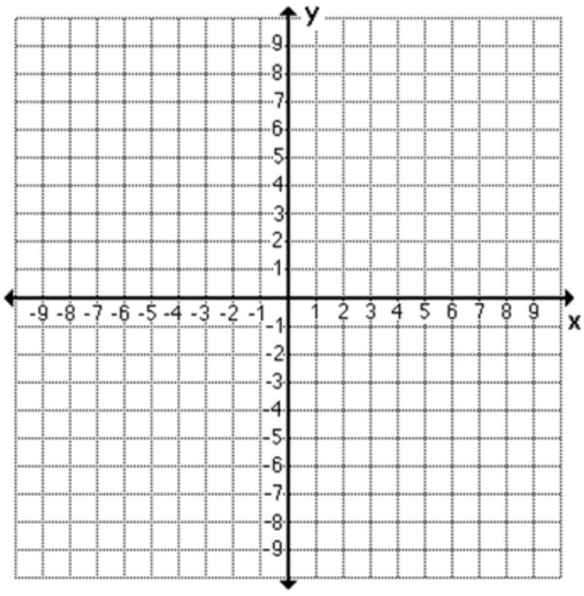
Points:

x	0	-1	-2	1	-3
y	-1	1	-1	-7	-7

Zeros: $\frac{2 \pm \sqrt{2}}{-2}$

X-Int: $(-1.7, 0)\ (-.29, 0)$

Example 3: $f(x) = x^2 + 6x + 7$



Vertex:

AOS:

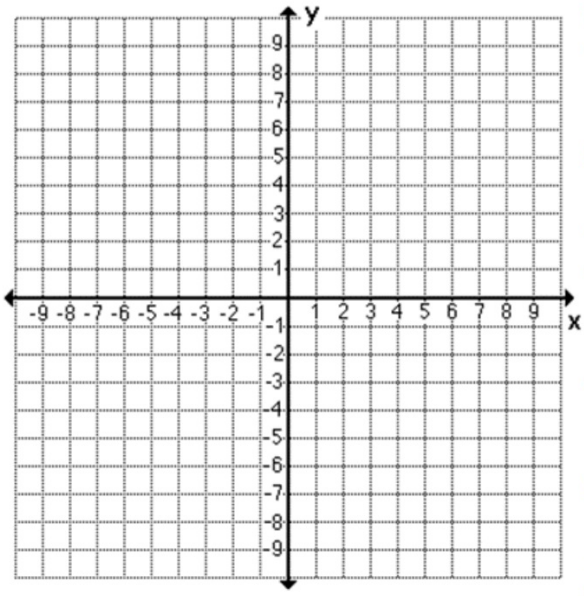
Y-Int:

Points:

Zeros:

X-Int:

Example 4: $f(x) = -2x^2 + 16x - 34$



Vertex:

AOS:

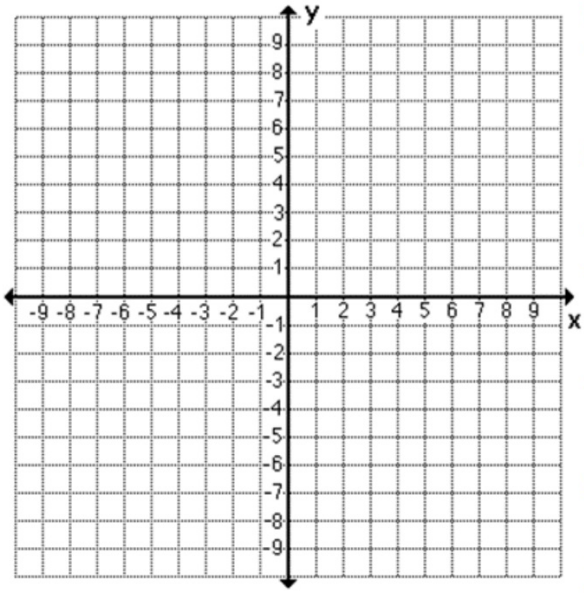
Y-Int:

Points:

Zeros:

X-Int:

Example 5: $f(x) = -x^2 - 8x - 17$



Vertex:

AOS:

Y-Int:

Points:

Zeros:

X-Int:

Wrap - Up

What is a parent graph?

What can the vertex also be referred to as?

How does the AOS help make graphing easier?

What is the relation between zeros and X-Intercepts?