Graphing Quadratic Equations

In This Unit:

Graphing Quadratic Equations

Bellwork
04/19/2012

Solve using the quadratic formula.

1. $2x^2-4x-14=0$

Lesson 14.1a
Describing a Quadratic

What You Need to Know:

To graph a quadratic equations:
   1. Find Axis of Symmetry [A.O.S.]
   2. Find Vertex
   3. Make a T-Chart
   4. Plot Graph

· If a is +, then the graph opens up.

· If a is -, then the graph opens down.

To find the A.O.S., use $x=-\dfrac{b}{2a}$.

This is also the x-coordinate of the vertex (x,y).

To find the y-coordinate of the vertex, plug the x-value back into the equation.

To make an t-chart, pick x-values to the right or to the left of the x-coordinate.

To finish the graph, mirror the points across the A.O.S.

Opens Up or Down?

Tell whether the graph opens up or down.

$y=2x^2$

$y=-4x^2-4x+12$

$y=-\frac{1}{2}x^2-x+1$

A.O.S. and Vertex

Find the A.O.S. and the vertex.

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

$y=-2x^2-8x+12$

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

$y=-\frac{1}{2}x^2-2x+1$

Bellwork
04/20/2012

Find the A.O.S. and Vertex.

1. $y = -\frac{1}{2}x^2 - 4x + 7$

$a = -\frac{1}{2} \qquad b = -4 \qquad c = 7$

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

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

$x = -\frac{4}{-1}$

$x = -4$

$y = -\frac{1}{2}(-4)^2 - 4(-4) + 7$

$-\frac{1}{2}(16) + 16 + 7$

$-8 + 16 + 7$

$y = 15$

$(-4, 15)$

Lesson 14.1b
Graphing a Quadratic

What You Need to Know:

To graph a quadratic equation:
1. Find Axis of Symmetry [A.O.S.]
2. Find Vertex
3. Make a T-Chart
4. Plot Graph

To make a t-chart, pick x-values to the right or to the left of the A.O.S.

To finish the graph, mirror the points across the A.O.S.

Graphing Quadratic Equations

Find the A.O.S. and the vertex.

$$y=2x^2$$

x	y
(1	2)
(2	8)

Vertex: ($0,0$)

AOS: x= $\dfrac{0}{2(2)}=0$

$a=2 \quad b=0 \quad c=0$

$y=2(0)^2 \quad y=2(1)^2 \quad y=2(2)^2$
$Y=0 \qquad\quad y=2 \qquad\quad y=8$

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

x	y
0	1
1	4
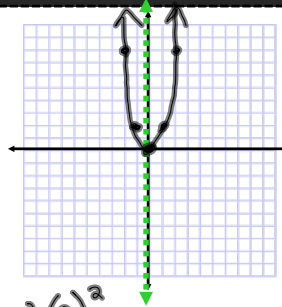
Vertex: ($-1,0$)

AOS: x= $\dfrac{-2}{2(1)}=-1$

$a=1 \quad b=2 \quad c=1$

$Y=(-1)^2+2(-1)+1 \qquad y=(0)^2+2(0)+1 \quad y=(1)^2+2(1)+1$
$Y=1+-2+1=0 \qquad\qquad y=1 \qquad\qquad y=4$

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

x	y
0	3
1	0
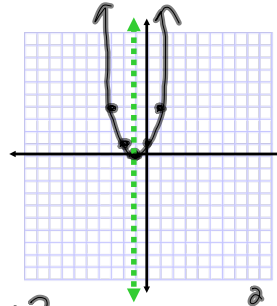
Vertex: ($-1,4$)

AOS: x= -1

$a=-1 \quad b=-2 \quad c=3$

$Y=-(-1)^2-2(-1)+3 \qquad y=-(0)^2-2(0)+3 \quad y=-(1)^2-2(1)+3$
$\quad -1+2+3 \qquad\qquad y=3 \qquad\qquad y=-1-2+3$
$\quad Y=4$
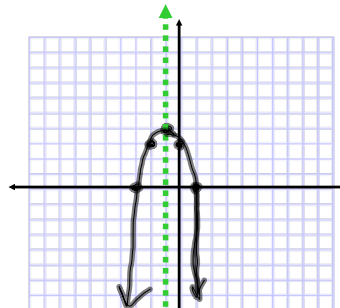
$y=-x^2+2$

x	y
1	1
2	-2

Vertex: ($0,2$)

AOS: x= $\dfrac{0}{2(-1)}=0$

$a=-1 \quad b=0 \quad c=2$

$Y=-(0)^2+2 \qquad y=-(1)^2+2$
$\quad y=2 \qquad\qquad y=-1+2$

$y=-(2)^2+2$
$y=-4+2$
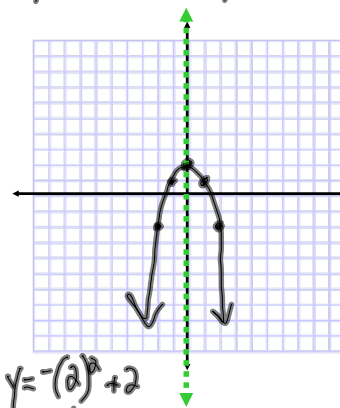
Homework Assignment

Worksheet
"Graphing Quadratic Equations"