March 12th

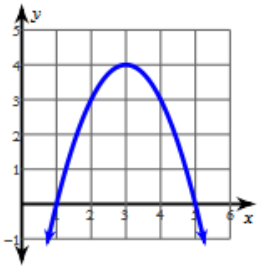
Due Today: 9.5
Due Tomorrow: HW 9.6

Unit 9: Quadratic Functions

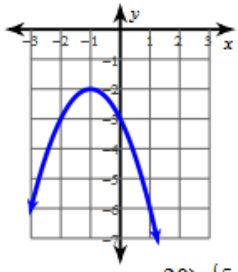
Lesson 9.6: How to find the vertex algebraically!

Get Ready: Check your homework!

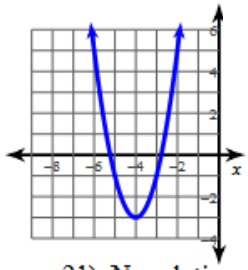
15)



16)



17)



18)

19) $\{2, 6\}$

20) $\{5, -1\}$

21) No solution.

22) $\{3, -5\}$

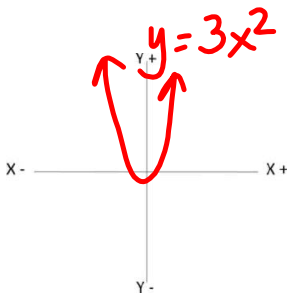
23) 1; two real solutions

24) -60; two imaginary solutions

How does the A value impact the shape of the parabola?

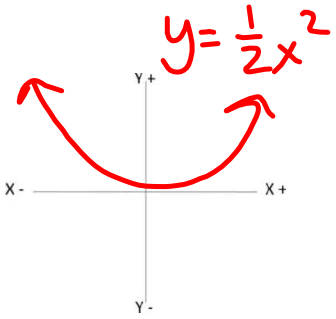
A is POSITIVE

and BIGGER than 1



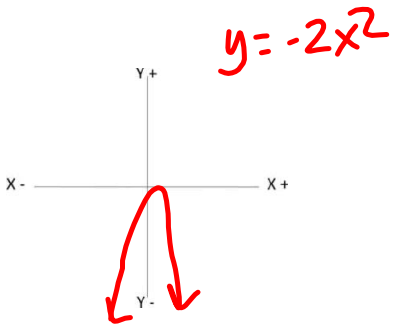
A is POSITIVE

and SMALLER than 1



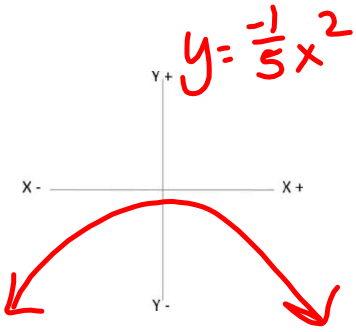
A is NEGATIVE

and BIGGER than 1



A is NEGATIVE

and SMALLER than 1



If A is biggger than 1 the parabola will be WIDE

If A is less than 1 the prabola will be NARROW

How can we find the vertex of this parabola???

$$y = 3x^2 + 18x + 24$$

✳ HANDY DANDY FORMULA! ✳

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

This formula is for the x coordinate of the vertex!

How can we find the vertex of this parabola???

$$y = 3x^2 + 18x + 24$$

$a=3,\ b=18,\ c=24$

$x = \frac{-b}{2a} = \frac{-18}{2(3)} = \frac{-18}{6} = -3$ ← This is the x coordinate of the vertex!

Now, plug the x into the equation to get the y.

$y = 3(-3)^2 + 18(-3) + 24$

$y = -3$ ← y coordinate of the vertex!

Vertex: (-3, -3)

→ write the vertex out as a point! don't forget the parentheses!

$$y = 3x^2 + 18x + 24$$

Can we find the axis of symmetry?

We know the AOS is a vertical line through the vertex... So if vertex = (-3, -3)

The AOS: x = -3

$y = 3x^2 + 18x + 24$

Can we find the roots?

The Roots are where the parabola crosses the x-axis, in other words, where $y=0$.

To find the Roots, let $y=0$ and Solve the equation.

$0 = 3x^2 + 18x + 24$

gcf

$0 = 3(x^2 + 6x + 8)$

$0 = 3(x+2)(x+4)$

~~$0=3$~~, $0 = x+2$ (−2 −2), $0 = x+4$ (−4 −4)

Roots: $x = -2, -4$

$y = 3x^2 + 18x + 24$

Vertex: $(-3, -3)$

AOS: $x = -3$

Roots: $x = -2, -4$

your answer should look like This!

What if we cannot find the roots by factoring?

Then try the quadratic formula!

If you end up with a NEGATIVE DISCRIMINANT then and only then are there NO REAL ROOTS!

Find the Vertex, Roots and AoS of each parabola w/o graphing!

1. $y = x^2 + 8x + 12$

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

3. $3x^2 + 6x$

4. $y = x^2 - 6x$

1. use handy dandy formula to find x-coord of vertex
2. plug x into equation to get y
3. write out vertex (x, y)
4. write out aos (x = xcoord.)
5. let y=0 + solve quad equation to find Roots
6. write out Roots
7. Circle Vertex, AOS, Roots.

Find the Vertex, Roots and AoS of each parabola w/o graphing!

1. $y = 3x^2 + 6x$

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

3. $y = x^2 + 8x + 12$

4. $y = x^2 - 6x$

Unit 9: Quadratic Equations

Lesson #	Name	Recap	HW
9.1	Intro to Quadratics		HW 9.1
9.2	Solving Quads by Completing the Square		HW 9.2
9.3	Solving Quads using the Quadratic Formula		Hw 9.3 QUIZ WED: - factoring, comp. the square, quad formula
9.4	Quiz + Picking a Method		HW 9.4
9.5	Graphing Parabolas		Finish Packet
9.6	Finding the Vertex Algebraically		HW 9.6 QUIZ MONDAY!