Honors Geometry

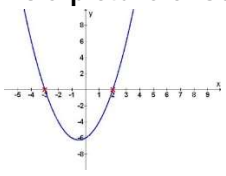
Factoring Review (Day 3-4)

Solving Quadratic Equation, Notes and Examples

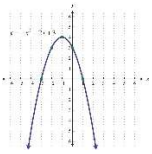
First off, we don't solve quadratic equations just for the fun of it. There is a reason why we are solving.

We need to start with what a quadratic equation is. A quadratic equation is an equation that has a degree of _____ meaning that the largest exponent that a variable can have is _____. A quadratic equation usually looks like this: $ax^2 + bx + c = y$

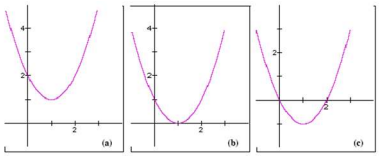
Like all equations a quadratic equation is a picture of something. Y=mx+b is the picture of a line. A quadratic equation is the picture of a parabola.



<u>What we are finding when we solve a quadratic equation is the x-intercepts of the parabola.</u> Parabolas can open up or down



and often times will have two solutions. However a parabola can have one solution (x-intercept)



or even no solutions.

We spend a lot of time learning factoring because that is the easiest and usually quickest way to solve a quadratic equation. Important: Since we are really finding x-intercepts we must set any quadratic equal to zero. (why? What variable are we making 0?)

_____

_____

Then factoring kind of makes sense.

Example:

$x^2 - x - 6 = 0$

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

$x-3=0$ $\quad\quad$ $x+2=0$ $\quad$ (why does this step make sense?)

x=3 $\quad\quad$ x=-2

In class examples

Solve by Factoring

1.) $x^2 - 64 = 0$

2.) $x^2 - 6x - 16 = 0$

3.) $x^2 + 3x = 40$

4.) $2x^2 + 3x + 1 = 0$

5.) $x^2 - 100 = 0$

6.) $x^2 + 6x = 0$

7) Explain why **$x^2 = -81$** does not have a solution. This also means what about the graph of this parabola? (think x-intercepts)

8) Finally a common mistake I see (very unfortunately) with even my older kids. What is wrong with the following and why? (meaning PLEASE don't ever do it)

$x^2 - x - 6 = 4$

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

$x - 3 = 4$ $\qquad$ $x + 2 = 4$

x=7 $\qquad$ x=2