Algebra 2 - Unit 2.6

Solving Equations using Quadratic Factoring

___

Refresher over "Basic Quadratic Factoring":

What to think about: What two numbers Multiply to give you C but Add to give you B?

$$f(x) = ax^2 + bx + c$$

Once you figure that out, write out your factors like (x   )(x   )

adds   multiplies

$$f(x) = x^2 - 3x + 2$$

$$(x - 1)(x - 2)$$

Ex: Factor $g(x) = x^2 + 8x + 15$

multiplies to give 15

Adds to give 8

$g(x) = (x+5)(x+3)$

5 & 3

Solving Quadratic Equations:

1. Get all of your terms on one side so that it is equal to 0.

2. Factor using any method.

3. Set each factor equal to 0.

4. Solve each of those equations.

Ex: Solve $x^2 - 4x - 32 = 0$

Step 1: Get $= 0$.

It is already $= 0$ ✓

Step 2: factor.

multiplies to give -32

Adds to give -4

$(x - 8)(x + 4) = 0$

Step 3: Set factors $= 0$

$x - 8 = 0$ $x + 4 = 0$

Step 4: Solve

$x = 8$ $x = -4$

Ex: Solve $x^2 - 9x + 18 = 0$

$\underbrace{}$ adds $\quad \underbrace{}$ multiplies

$-6 \; \stackrel{?}{\vdots} \; -3$

factor...

$(x-6)(x-3) = 0$

set factors $= 0$

$x - 6 = 0 \qquad x - 3 = 0$

Solve $\quad +6 \quad +6 \qquad\qquad +3 \quad +3$

$$\boxed{x = 6 \qquad\qquad x = 3}$$

For problems like this, when you move terms over you will be combining like terms.

Try to move the terms to the side that makes your x squared positive.

Solve: $x^2 - x + 3 = 4x - 3$

$$-4x + 3 \quad -4x + 3$$

$$x^2 - 5x + 6 = 0$$

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

$$x - 3 = 0 \qquad x - 2 = 0$$

$$x = 3 \quad \varepsilon \quad x = 2$$

Ex: $3x^2 + 4x - 13 = x + 2x^2 + 15$

$-2x^2 \quad -x \quad -15 \quad -x \quad -2x^2 \quad -15$

which side should I move stuff to?? To the Left! To keep x^2 positive!

$x^2 + 3x - 28 = 0$ ⟩ Factor

$(x+7)(x-4) = 0$

$x+7 = 0 \quad x-4 = 0$

$\boxed{x = -7 \quad \& \quad x = 4}$

Before moving everything to one side, decide which side would be best. Look to see what side you have to move things to so that x squared would be positive.

Solve: $2 - 3x + 4x^2 = 5x^2 + 14 - 10x$

$-2 \quad +3x \quad -4x^2 \quad -4x^2 \quad -2 \quad +3x$

$0 = x^2 - 7x + 12$

$0 = (x-4)(x-3)$

$x = 4 \quad x = 3$

Homework:

U2.6 & U2.7 WS

You will have a QA over this lesson, so make sure you are prepared to take it by the end of class tomorrow.