Make sure the 1st page that you turn in has

Name___________
Teachers Name ___________
Subject _____________
Period __________
Assignment Week #1

Hold onto the 19.1 classwork that we started on March 13th and the 19.2 classwork that I posted online. Also, keep the 19.1-19.3 packets that we tore out on March 11th. The Algebra teachers decided it would be best if we focused on factoring and solving quadratics. If we have time, we will go back to those.

If you would rather turn in your work electronically (which is easier for everyone) either up load it onto Teams (you'll need to access your 365 account) or email me a picture.

The following are the handwritten notes. If you can access the internet, it may be easier to watch the videos on the website khslawrence.weebly.com

After looking at and reviewing the notes, do the assignments and make sure you show all work.

<u>Review of multiplying binomials</u>

Remember that I gave you 3 different ways to multiply binomials (4 if you include vertical but I don't think anyone used it)

Multiply $(\mathbf{2x+3})(\mathbf{x+4})$

Multiplying Binomials Using the Distributive Property

Multiply
$$(2x+3)(x+4)$$

Distribute
$$2x(x+4)+3(x+4)$$

Redistribute
$$2x(x)+2x(4)+3(x)+3(4)$$

Simplify
$$2x^2+8x+3x+12$$

Combine like terms
$$2x^2+11x+12$$

Multiplying Binomials Using FOIL

F=first terms
O=outer terms
I=inner terms
L=last terms

Multiply
$$(2x+3)(x+4)$$

Multiply the first terms F
$$(2x)(x)=2x^2$$
Multiply the outer terms O
$$(2x)(4)=8x$$
Multiply the inner terms I
$$(3)(x)=3x$$
Multiply the last terms L
$$(3)(4)=12$$

Combine like terms
$$2x^2+11x+12$$

Multiplying Binomials using the Box Method
(like a Punnett Square in Science)

Multiply
$$(2x+3)(x+4)$$

Put one binomial on the top of the box

Put the other binomial on the left of the box

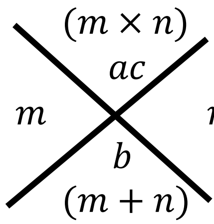
	x	$+4$
$2x$	$2x^2$	$8x$
$+3$	$3x$	12

Multiply the top and left

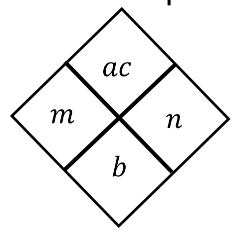
Combine like terms
$$2x^2+11x+12$$

Diamond Problems

the diamond (or X) method

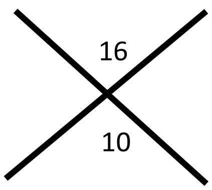


This is called the diamond method since sometimes the shape looks like this

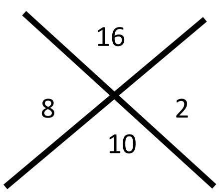


Find 2 numbers (m and n) that when multiplied together give the **top** number but when added together give the **bottom** number.

Example: Find 2 numbers whose product is the top number and sum is the bottom number.



Think of 2 numbers that multiply to 16 and also add to 8.
Put those numbers on the left and right.
It doesn't matter the order.
Try to think of the multiplication first. See if it works for addition.



8 and 2 multiply to 16 and also add to 10.

21.1 Factoring $ax^2 + bx + c$ when $a = 1$

The polynomial $ax^2 + bx + c$ is a quadratic expression in standard form. Its power or degree is 2 since the highest exponent is 2.

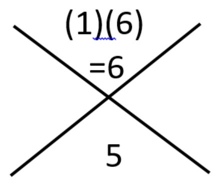
To factor $ax^2 + bx + c$, use the diamond (or X) method. (remember that this polynomial is in standard form since the exponents are in descending order.) Since $a = 1$ in this section, the top number will be c. Factoring is simply the inverse of multiplying. We want to find the 2 binomials that multiply to the quadratic.

Example:

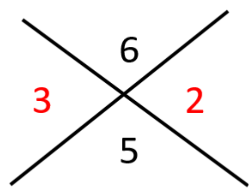
Put m and n in the factored form: $x^2 + bx + c = (x + m)(x + n)$

Ex: Factor $x^2 + 5x + 6$

Make the diamond or X



Find two numbers that multiply to 6
and add to 5.



Use the numbers on the left
and right for the factored form. $x^2 + 5x + 6 = (x + 3)(x + 2)$

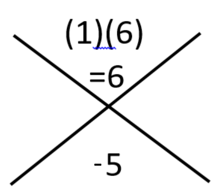
The order doesn't matter since multiplication is commutative (3x2=2x3), so you could also write the answer as $(x + 2)(x + 3)$

(If you multiply $(x + 3)(x + 2)$ you should get $x^2 + 5x + 6$ since they are inverse operations.)

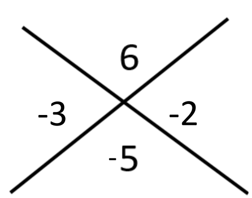
Do the same example with $-5x$ instead of $+5x$

Ex: Factor $x^2 - 5x + 6$

Make the diamond or X



Find two numbers that multiply to 6
and add to -5.



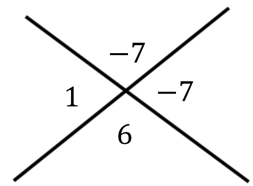
Use the numbers on the left
and right for the factored form. $x^2 - 5x + 6 = (x - 3)(x - 2)$

21.1 Factoring $ax^2 + bx + c$ with a GCF

The GCF is the greatest or largest number that divides evenly into two or more numbers.

Sometimes the quadratic expression will have a GCF that needs to be factored out first before you can continue factoring.

Factor $3x^2 + 18x - 21$



3, 18 and 21 have a GCF or 3 so first factor out a 3.

$3(x^2 + 6x - 7)$

Use the diamond or X method to find 2 numbers that multiply to -7 and add to 6. Don't forget the include the factored 3 in your answer since it's part of the problem and you would need it to multiply to get back to the original problem.

$3(x - 7)(x + 1)$

21.1 Solving $ax^2 + bx + c$

Factoring a trinomial means to find two binomials that, when multiplied, equal the trinomial.

Ex. Factor $x^2 + 5x + 4$

$(x + 4)(x + 1)$

Solving (also known as finding zeros or the solutions) a trinomial by factoring means setting the equation equal to zero (if not in standard form), factoring, and using the Zero Product Property to find the zeros or x-intercepts.

Ex. Solve $x^2 + 5x + 4 = 0$

$(x + 1)(x + 4) = 0$

$x = -1, -4$

Using the Zero Product Property:
$x + 1 = 0$ or $x + 4 = 0$ Solve both equations.
So $x = -1$ or $x = -4$
They are the solutions to the quadratic.

The Zero Product Property states that if $a \cdot b = 0$, then either $a = 0$ or $b = 0$ (or both = 0) Remember that the only way to get an answer of 0 in a multiplication problem is if one or both numbers being multiplied are 0.
A product of factors is zero if and only if one of the factors is zero.