

Bellwork: Algebra 1

1. Happy Tuesday Everyone! :)
2. Write down your homework.
3. You need your Algebra Nation workbook and a calculator.
4. Answer the following question on your TUESDAY

Bellwork: A function is shown.

$$f(x) = x^2 + 2x - 35$$

Based on the Gizmo activity from yesterday, what are the factors of the trinomial?

$$(x - 5)(x + 7)$$

Section 5 – Topic 2
Factoring Quadratic Expressions

p. 125

Let's review the two methods we used for multiplying polynomials.

Area Model:

	x	$2y$	$-7z$
3	$3x$	$6y$	$-21z$

We can use these same methods to factor out the greatest common factor of an expression.

Area Model: $5x^2 - 7x + 6$

$2x$	$10x^3$	$-14x^2$	$12x$
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Use the area model to write an equivalent expression for $(2x + 5)(x + 3)$.

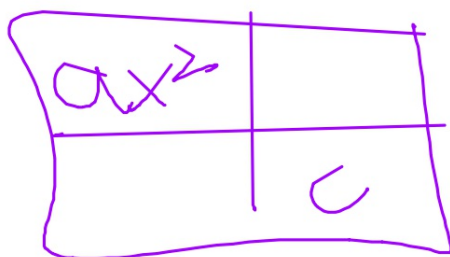
$30x^2 = 30x^2$

$2x^2$	$6x$
$5x$	15

$2x^2 + 11x + 15$

We can use this same area model to factor a quadratic expression. Look at the resulting trinomial and notice the following four patterns:

- The first term of the trinomial can always be found in the top left rectangle.
- The last term of the trinomial can always be found in the bottom right rectangle.
- The second term of the trinomial is the sum of the bottom left and top right rectangles.
- The product of the diagonals are always equal.



$$\underline{ax^2} + \textcircled{bx} + \underline{c}$$

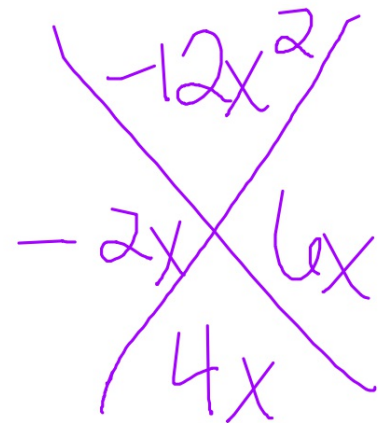
Let's Practice!

1. Consider the quadratic expression $3x^2 + 4x - 4$.

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a. Factor using the area model.

	$3x$	-2
x	$3x^2$	$-2x$
2	$6x$	-4



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

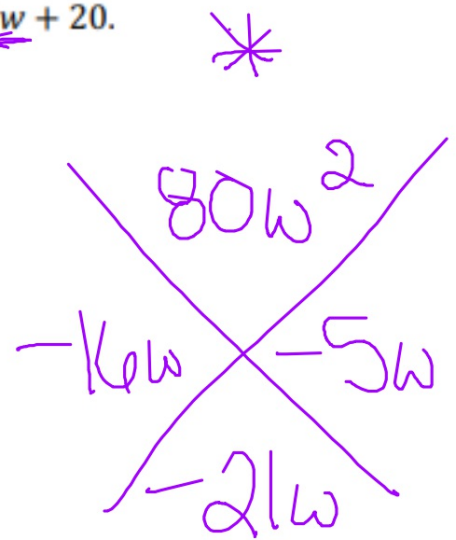
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Try It!

① Consider the quadratic expression $4w^2 - 21w + 20$.

a. Factor using the area model.

	w	-4
$4w$	$4w^2$	$-16w$
-5	$-5w$	20



	$4w$	-5
w	$4w^2$	$-5w$
-4	$-16w$	20

$$(w-4)(4w-5) +$$

BEAT THE TEST!

1. Identify all factors of the expression $18x^2 - 9x - 5$. Select all that apply.
- $2x + 5$
 - $6x - 5$
 - $18x - 5$
 - $3x + 5$
 - $3x + 1$

Section 5 – Topic 3
Solving Quadratic Equations by Factoring

Once a quadratic equation is factored, we can use the **zero product property** to solve the equation.

The zero product property states that if the product of two factors is zero, then one (or both) of the factors must be

zero.

- If $ab = 0$, then either $a = 0$, $b = 0$, or $a = b = 0$.

To solve a quadratic equation by factoring:

- Step 1: Set the equation equal to zero.
- Step 2: Factor the quadratic.
- Step 3: Set each factor equal to zero and solve.
- Step 4: Write the solution set.

Let's Practice!

1 Solve for b by factoring $b^2 + 8b + 15 = 0$.

	b	5
b	b^2	$5b$
3	$3b$	15

	$15b^2$
$3b$	$5b$
	$8b$

$$(b+3)(b+5) = 0$$

$$b+3=0$$

$$b+5=0$$

2 Solve for f by factoring $10f^2 + 17f + 3 = 0$.

	$2f$	3
$5f$	$10f^2$	$15f$
1	$2f$	3

	$30f^2$
$15f$	$2f$
	$17f$

$$(5f+1)(2f+3) = 0$$

$$5f+1=0$$

$$-1 \quad -1$$

$$\frac{5f}{5} = \frac{-1}{5}$$

$$f = \underline{\underline{-\frac{1}{5}}}$$

$$2f+3=0$$

$$-3 \quad -3$$

$$\frac{2f}{2} = \frac{-3}{2}$$

$$f = \underline{\underline{-\frac{3}{2}}}$$

Try It!

3. Solve for j by factoring $6j^2 - 19j + 14 = 0$.

Section 5 - Topic 4
Solving Other Quadratic Equations by Factoring

Many quadratic equations will not be in standard form.

$$ax^2 + bx + c = 0$$

- The equation won't always equal zero.
- There may be a greatest common factor (GCF) within all of the terms.

Let's Practice!

① Solve for m : $3m^2 + 30m - 168 = 0$.

$$\underline{\underline{3(m^2 + 10m - 56) = 0}}$$

② Solve for x : $(x + 4)(x - 5) = -8$.

$$(x+4)(x-5) + 8 = 0$$

$$x^2 + 4x - 5x - 20 + 8 = 0$$

$$\boxed{x^2 - x - 12 = 0}$$

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	x	-4
x	x^2	$-4x$
3	$3x$	-12

$$\begin{array}{r} -12x^3 \\ -x \\ + \end{array}$$

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

Try It!

3. Solve for d : $6d^2 + 5d = 1$.

4. Solve for p : $p^2 + 36 = 13p$.