

Essential Question 3/2/2021

How can I factor quadratic trinomials when $A > 1$?

Learning Target



Factor Quadratic Trinomials when $A > 1$

Looking for Patterns

What do you observe in the following Area Models?

	3x	+4
x	3x ²	+4x
-3	-9x	-12

Handwritten notes: "1st" with an arrow pointing to the first column, and "last" with an arrow pointing to the last column.

(x-3)(3x+4) = 3x² - 5x -12

	4x	+3
2x	8x ²	+6x
+1	+4x	+3

Handwritten notes: A box around the top row, and a diagonal line from the top-right to the bottom-left cell.

(2x+1)(4x+3) = 8x²+10x+3

Factoring is the inverse of distributing or multiplying.

Factoring Using Area Model

I do

No GCF

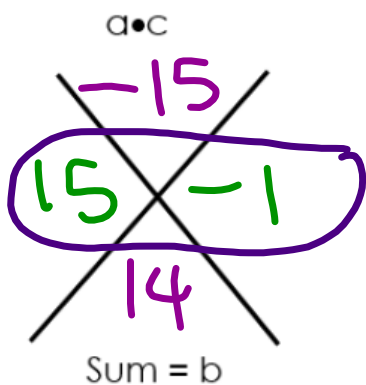
<p>STEP 1:</p> <ul style="list-style-type: none"> ALWAYS check to see if you can factor out a GCF. 	<p>Factor: $2x^2 - 5x + 3$</p> <p>$a=2$ $b=-5$ $c=3$</p>						
<p>STEP 2:</p> <ul style="list-style-type: none"> Complete a "Big X" and T-chart Determine what two numbers can be multiplied to get your "a·c" term and added to get your "b" term. 							
<p>STEP 3:</p> <ul style="list-style-type: none"> Create a 2x2 Area Model and place your original "a" term in the top left box and "c" term in the bottom right box. Fill the remaining two boxes with the two numbers you found in "Big X" and place an x after them. 	<p>$x-1$</p> <table border="1" style="display: inline-table;"> <tr> <td>$2x$</td> <td>$2x^2$</td> <td>$-2x$</td> </tr> <tr> <td>-3</td> <td>$-3x$</td> <td>3</td> </tr> </table>	$2x$	$2x^2$	$-2x$	-3	$-3x$	3
$2x$	$2x^2$	$-2x$					
-3	$-3x$	3					
<p>STEP 4:</p> <ul style="list-style-type: none"> Factor out a GCF from each row and column 							
<p>STEP 5:</p> <ul style="list-style-type: none"> Check your factors on the outside by multiplying them together to make sure you get all the expressions in your box. 	<p>Factored Form: $(x-1)(2x-3)$</p>						

We do

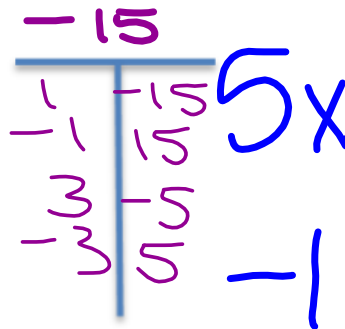
Using the Area Model. Factor the following trinomials.

$a=5; b=14; c=-3$

1. $5x^2 + 14x - 3$



Factors of a•c



	x	$+3$
$5x$	$5x^2$	$15x$
-1	$-1x$	-3

Factored Form: $(5x-1)(x+3)$

Practice Factoring $A > 1$ - You do
 Using the Area Model. Factor the following
 trinomials.

2. $2x^2 - 17x - 30$ $a=2$ $b=-17$, $c=-30$ Factored Form: $(2x+3)(x-10)$

~~-60~~
 3 -20
 -17

$2x$ x -10

$2x^2$	$-20x$
$3x$	-30

3. $12x^2 + 56x + 64$ $a=3$ $b=14$, $c=16$ Factored Form: $4(x+2)(3x+8)$

4
 $4(3x^2 + 14x + 16)$

~~48~~
 6 8
 14

48

$3x^2$	$6x$
$8x$	16

1 48 $3x$
 2 24
 3 16 $+8$
 4 12
 6 8

4. $\frac{6x^2 - 40x + 24}{2}$ GCF = 2 Factored Form: $2(x-6)(3x-2)$

$a=3$ $b=-20$ $c=12$

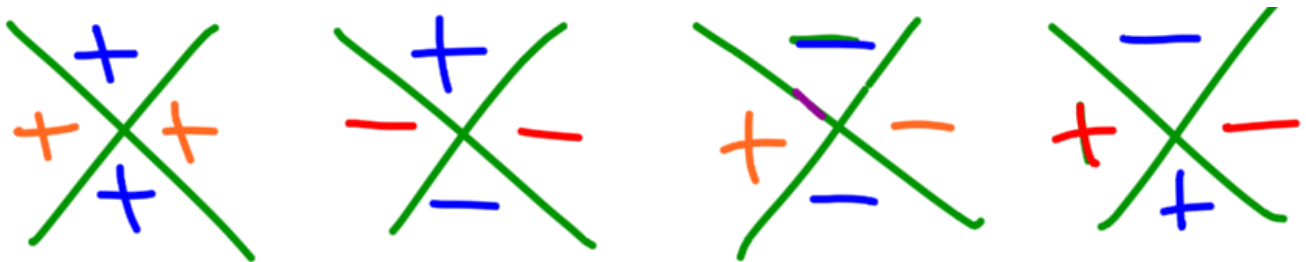
$2(3x^2 - 20x + 12)$

	x	-6
3x	$3x^2$	$-18x$
-2	$-2x$	12

	36	
-1	-36	
-2	-18	
-3	-12	
-4	-9	
-6	-6	

~~$\begin{matrix} & 36 & \\ -2 & & -18 \\ & -20 & \end{matrix}$~~

Remember: You must ALWAYS include the GCF on the outside of the factored form!



Practice Factoring at Your Boards!

Take a look at the following trinomials and factor out the GCF, then use the Area Model to factor.

a. $\underline{10x^2 - 72x + 72}$

$$2(5x^2 - 36x + 36)$$

	180
-1	-180
-2	-90
-3	-60
-4	-45
-6	-30

	180
-6	-30
	-36

	x	-6
5x	$5x^2$	$-30x$
-6	$-6x$	36

$$= 2(x-6)(5x-6)$$

$$\text{b. } 25x^2 + 210x - 400$$

$$5(25x^2 + 42x - 80)$$

$$\begin{array}{r} -400 \\ \hline 50 \quad -8 \\ \hline 42 \end{array}$$

$$\begin{array}{r} 5x \quad -8 \\ \times \\ 25x^2 \quad -8x \\ +10 \quad 50x \quad 80 \end{array}$$

$$= 5(5x - 8)(x + 10)$$

c. $7x^2 - 13x - 2$ No GCF
a b c

1	-14	-14	-13
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$7x$
 $+1$

	x	-2
$7x^2$	$7x^2$	$-14x$
x	x	-2

$$= (7x + 1)(x - 2)$$

Remember...your factored form should always been equivalent to the quadratic expression you started with so you must always include the GCF on the outside of the factored form.

Closing: Exit Ticket

$$\frac{10p^2 + 28p + 18}{2}$$

$2(5p^2 + 14p + 9)$

~~$5 \quad 9$~~

$5p + 9$

$5p^2$	$5p$
$9p$	9

$(p+1)(5p+9)$

$\begin{array}{r} 45 \\ 1 \overline{) 45} \\ \underline{45} \\ 0 \end{array}$

Attachments

Functions notation.ppt

Functions Practice HW.docx

Functions notation notes.ppt