Bellwork

Multiply each of the following sets of binomials:

1. $(2x + 3)(x - 5)$

2. $(8x - 3)(x - 7)$

3. $(6x + 7)(3x + 1)$

4. $(6x - 5)(10x + 3)$

Recall the Distributive Property

In the notes about the Distributive Property we showed the property when multiplying two binomials, two trinomials, or a mix of the two of them.

Property of Focus:

$$(ax + b)(cx + d) = ax(cx + d) + b(cx + d)$$
$$= (ac)x^2 + (ad)x + (bc)x + bd$$
$$= (ac)x^2 + (ad + bc)x + bd$$

Investigation of the Trinomial Result

Property of Focus:

$$(ax + b)(cx + d) = ax(cx + d) + b(cx + d)$$
$$= (ac)x^2 + (ad)x + (bc)x + bd$$
$$= (ac)x^2 + (ad + bc)x + bd$$

What do you notice about the first term of the end result here?

What do you notice about the middle term of the end result here?

What do you notice about the last term, the constant, of the end result here?

Factoring Trinomial Expressions

Standard Form:

$ax^2 + bx + c$

Focus:

We will focus on the case where $a \neq 1$

So we are really looking at -

$$ax^2 + bx + c$$

Procedure

Step 1: Multiply a and c.

Step 2: Find the factors of a and c that combine to get the middle term by the second sign.

Step 3: Rewrite the expression as follows...

ax^2 + (factor of ac)x + (factor of ac)x + c

Step 4: Group the first two terms together and group the last two terms together.

LEAVE THE SIGN IN THE MIDDLE

Note - If neg change sign inside last ( )'s.

Step 5: Find the GCF of each set of ( ) separately.

Now looks like... $f_1x(\#x + p) + f_2(\#x + p)$

Step 6: Write the final answer...

$(f_1x + f_2)(\#x + p)$

Examples

Factor each of the following expressions:

1. $3x^2 + 19x + 20$

2. $4x^2 - 23x + 15$

More Examples

Factor each of the following expressions:

3. $2x^2 + x - 6$

4. $5x^2 - 13x - 6$