Bellwork

Multiply the following polynomials:

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

2. $(x - 9)(x - 9)$

3. $(x + 3)(x + 3)$

4. $(x + 5)(x - 1)$

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:

$$(x + a)(x + b) = x(x + b) + a(x + b)$$

$$x^2 + bx + ax + ab$$

$$x^2 + ax + bx + ab$$

$$x^2 + (a+b)x + ab$$

Investigation of the Trinomial Result

Property of Focus:

$(x + a)(x + b) = x(x + b) + a(x + b)$

$x^2 + bx + ax + ab$

$x^2 + ax + bx + ab$

$x^2 + (a+b)x + ab$

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 = 1

So we are really looking at...

$x^2 + bx + c$

Procedure

Step 1: Create the "U" to find **ALL** of the factors of the constant C.

Step 2: Identify the set of factors that combine by the **SECOND** sign to get the middle number.
We will let these factors be p and q.

Step 3: Write the factored version of your trinomial.
$(x + p)(x + q)$

Step 4: **CHECK YOUR ANSWER**

Examples

Factor each of the following expressions:

1. $x^2 - 10x - 75$

2. $x^2 - 14x + 33$

Common Errors

Find the error in this example:

Ex) Factor $x^2 + 10x + 24$

Factors of 24

1 and 24

2 and 12

3 and 8

4 and 6

Well 12 minus 2 will give us 10...

So the Answer has to be **(x +12)(x - 2)**

Examples

Factor each of the following expressions:

3. $x^2 + 20x + 91$

4. $x^2 + 4x - 140$

Examples

Factor each of the following expressions:

5. $x^2 + 26x + 169$

6. $x^2 - 225$