9.7 Factoring

Objectives:

- To factor the GCF
- To factor quadratic equations with leading coefficient of 1
- To solve by factoring

GCF: Greatest common factor

1st rule of factoring: Factor out the GCF!!!

Example 1: GCF

a. $x^2 + 2x$

$x(x+2)$

b. $3x + 6$

$3(x+2)$

c. $8x^2-4x$

$4x(2x-1)$

Pattern #1

FOIL a. $(x+2)(x+3)$

$x^2+3x+2x+6$

x^2+5x+6

b. $(x-2)(x-3)$

x^2-5x+6

What's the pattern?

Example 2

a. x^2+6x+8

$(x+4)(x+2)$

b. $3x^2-21x+36$

$3(x^2-7x+12)$

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

c. $x^2-10x+24$

$(x-6)(x-4)$

1 24
2 12
3 8
6 4

Rule #1

If the last sign is POSITIVE, both signs are the same, and they must match the middle number.

Pattern #2

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

x^2+4x-5

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

x^2-x-12

What's the pattern?

Example 3

a. $x^2-2x-35$

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

b. $x^2+3x-18$

$(x+6)(x-3)$

c. x^2+x-20

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

d. $2x^2+2x-12$

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

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

Rule #2

If the last sign is NEGATIVE, the signs are different and the bigger sign will match the middle number.

Zero Product Property: If AB=0, then either [redacted] or [redacted].

Solve by factoring.

Example 4

a. $(x-2)(x-3)=0$

b. $(x+1)(x-4)=0$

c. $x^2+2x-8=0$

d. $x^2-8x+15=0$

9.7 Factoring-Day 2

Objective: To factor and solve quadratics with a leading coefficient other than 1.

Steps to factor $ax^2 + bx + c$:

1) Let's factor $3x^2 + 17x + 10$

Find the factors of the coefficient of x^2.

2) Find factors of c: $3x^2 + 17x + 10$

Factors of 10:

Factor $3x^2 + 17x + 10$

( ) ( )

Target: 17x

Examples:

1. $2x^2 + 11x + 5$

( )( )

Target:

2. $3x^2 - 4x - 7$

( )( )

Target:

3. $2x^2 + 10x + 8$

( )( )

Target:

4. $3x^2 - 19x + 6$

( )( )

Target:

5. $6x^2 - 7x - 5$

( )( )

Target:

6. $8x^2 - 2x - 15$

( )( )

Target:

Example 2

a) $3x^2-17x+10$

b) $3k^2+32k-11$

c) $5b^2+17b+14$

d) $2a^2+7a+6$

e) $6x^2-9x+5$

f) $18n^2+9n-14$