By the end of the lesson, we will be able to:

~ Factor out the Greatest Common Factor

~ Factor by Grouping

Remember the Distributive Property?

$$a(x+y) = ax + ay$$

Well, today, we are going to "**UN**-distribute".

It's called **FACTORING**.

$$ax + ay = a(x+y)$$

Lesson 5.4: GCF and Factor by Grouping

Factors: Factors are numbers/polynomials that are multiplied together to get the whole.

Example:

3(2) = 6 ~ 3 and 2 are factors of 6 ~

$$(3x + 1)(x - 5) = 3x^2 - 14x - 5$$

~ (3x +1) and (x-5) are factors of the right side polynomial. ~

We are going to look for the Greatest Common Factor (GCF) of polynomials.

Let's start off with numbers.

~What is the GCF of 6 and 15?

~What is the GCF of 48 and 72?

* NOTE: we can break numbers up into Prime Facorization to help us find the GCF.

Lesson 5.4: GCF and Factor by Grouping

Find the GCF:

1. $4x, 12$

2. $6x^3, 12x^2, 15x$

3. $4x^3y^4, 8x^2y^3, 12xy^2$

Factoring

***Factor out* the *GCF*:**

1. $7x^2 - 14x$

2. $6y^3 - 14y^2 + 10y$

3. $2m^4n^2 + 8m^3n^4 - 6m^2n^5$

***Factor out* the GCF:** (If the coefficient of the highest degree term is negative, we often want to factor out the negative as part of the GCF.)

5. $-8z + 16$

6. $-2b^3 + 10b^2 + 8b$

Lesson 5.4: GCF and Factor by Grouping

***Factor out* the GCF:** Sometimes the GCF is a Binomial. Factor the Binomial out.

7. $4x(x-3)+5(x-3)$

8. $(c+4)(c-1)+(5c-2)(c-1)$

Factor by Grouping

see pg. 393

Step 1: Group the terms with common factors. Sometimes it will be necessary to rearrange the terms.

Step 2: In each grouping, factor out the common factor.

Step 3: Factor out the common factor that remains (usually a Binomial).

Step 4: Check your answer.

Factor by Grouping

Examples:

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

Factor by Grouping

Examples:

2. $6x^2 + 9x - 10x - 15$

By the end of the lesson, we will be able to:

~ Factor out the Greatest Common Factor

~ Factor by Grouping

CAN YOU?

Homework:

Page 394: # 19, 23 - 33 odds, 39, 41, 45, 49, 51, 55, 59

(14 problems)