Unit 1 – Polynomial and Rational Expressions

2.2, 2.3: Multiplying and Factoring Polynomials

Learning Goal: We are learning how to multiply and factor polynomial expressions

2.2: *Multiplying Requires The Distributive Property*

Here we see two "new" concepts (in addition to what you saw last day):

ab
a·b
a×b

1) **The Distributive Property** (for multiplication **over** addition)

Given 3 numbers a, b, c, then

$a(b+c) = ab + ac$ (expanding →, factoring ←)

"switch places"

Note: you may also see the **Commutative Property**, but it's not so important to today's stuff

$ab = ba$ ‖ $\frac{a}{b} \neq \frac{b}{a}$

$a+b = b+a$ ‖ $a-b \neq b-a$

only works for + & ×

2) **The Associative Property** (for multiplication)

a, b, c

Given 3 numbers all multiplied together then

$a(bc) = (ab)c = b(ac)$ using the commutative property

Example 2.2.1:

coefficients w/ coefficients
variables w/ variables

Expand and Simplify:

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

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

$= 6x^3 - 9x^2 + 6x$

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

Double Distributive

or FOIL

$= 6x^2 + 2x - 15x - 5$

$= 6x^2 - 13x - 5$

c) $(5-2x)^2$ ≠ $25 + 4x^2$

See Example 3, Pg. 93 about **equivalence**

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

$= 25 - 10x - 10x + 4x^2$

$= 25 - 20x + 4x^2$

2 formulas for squaring a binomial.

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

or $(a-b)^2 = a^2 - 2ab + b^2$

(I like to associate the "back" two

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

Associate!!

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

$= 3x^3+14x^2-5x+6x^2+28x-10$

$= 3x^3+20x^2+23x-10$

double distribute

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

e) $(x-2y+3z)^2$ $= (x-2y+3z)(x-2y+3z)$

$= -2yx = -2xy.$

$= x^2-2xy+3xz-2xy+4y^2-6yz+3xz-6yz+9z^2$

$= x^2-4xy+6xz+4y^2-12yz+9z^2$

2.3: *FACTORING* UNDOES *THE DISTRIBUTIVE PROPERTY*

On the class video page (linked in Edsby) you will find videos demonstrating the skills necessary for factoring. Watch those videos and make notes for yourself. I will look at your notes. Next day we will have a full period to practice the skills seen in the videos.

Success Criteria:

- I can determine the product of two polynomials by extending the distributive property. Sometime we call this "FOIL"
- I can invert expanding by FACTORING a polynomial expression. I can use the techniques: Common Factoring; Decomposition; Difference of Squares; Perfect Square Trinomials; Grouping.

Class/Homework: Section 2.2

1) Read Examples 2 and 3 on Pgs 92 – 93 (*In **Ex 2**, do you prefer Fred's or Atish's solution? Why? In **Ex 3** which solution do you prefer? Why? Are both entirely reliable?*)
2) Pg 95 #4ace, 5, 6ace, 7 (Hint: *Lee > Mathias…***WHY do I make that claim?**), 9, 11

Section 2.3

1) Watch the factoring videos
2) Problems sets will be distributed next day.