ADDING AND SUBTRACTING POLYNOMIALS

LEARNING INTENTION:
TO SIMPLIFY ALGEBRAIC EXPRESSIONS BY ADDING AND SUBTRACTING LIKE TERMS.

SUCCESS CRITERIA:
IDENTIFY LIKE TERMS

- ADD OR SUBTRACT THE NUMBERS TOGETHER
- KEEP THE "LAST NAME"

WHAT THE HECK IS A POLYNOMIAL?

- Consider the expression $3x^2 + 4y - 1$
- It has 3 terms, each separated by a + or a – sign
  - Fun Fact! The word *polynomial* comes from *poly* (many) and *–nomial* (in this case meaning "term"), so it means "many terms"

- A polynomial can have
  - *constants* (like 1, 20, ¾)
  - *variables* (like x, y, z)
  - *exponents* (like the 2 in y^2)
  - *Coefficient (*like 3 in $3x^4$)

- There are a few special cases:
  - If a polynomial has only 1 term, it's a *monomial*
    - *Ex: $3x^2$, $4xy$, 15*
  - If a polynomial has 2 terms, it's a *binomial*
    - *Ex: $4x^2 - 1$*
  - If it has 3 terms, it's a *trinomial*
    - Ex: $4x^2 - 2x + 1$

- How to properly write a polynomial
  - You write a polynomial in <u>decreasing</u> order of the exponent. This is <u>*standard form.*</u>

- Which is written in standard form?

  $4x^3y + 12xy^2 + 2xy + 20$

  $20 + 12xy^2 + 4x^3y + 2xy$

LIKE TERMS

- You have to pay **very** close attention to the variables, and the exponents. Terms are only LIKE TERMS if the variables ***AND*** exponents are identical

$4x$ and 3	**NOT like**	Second term has no variable
$4x$ and $3y$	**NOT like**	variables are not the same
$4x$ and $3x^2$	**NOT like**	variables do not have same exponents
$4x$ and $3x$	**like**	variables are same, exponents are same
$4x^2y$ and $3xy^2$	**NOT like**	x is squared in first term, y is squared in second term
$4x^2y$ and $3x^2y$	**like**	variables are same, exponents are same

ADDING AND SUBTRACTING

- Review:
- (4x +4) + (2x + 2)
  - = 6x + 6

- (4x + 4) – (2x **+ 2**)
  - = 4x + 4 – 2x **– 2**
  - = 2x + 2

- you can only add or subtract LIKE TERMS
- Add or subtract the *coefficients*. The variables and exponents do not change.
- If there's a **negative sign in front of a bracket**, change the sign inside the bracket to the opposite (+ or -)

KICKING IT UP A NOTCH!

Example 1:

$(3x^2 + 4x + 2) + (2x^2 + 3x + 4)$

$= 3x^2 + 4x + 2 + 2x^2 + 3x + 4$

$= 5x^2 + 7x + 6$

Example 2: **Stop and flip signs inside the bracket after the minus sign!

$(2x^2 + 3x - 4) - (5x^2 - 2x + 6)$

$= 2x^2 + 3x - 4 - 5x^2 + 2x - 6$

$= -3x^2 + 5x - 10$

SUMMARY FOR ADDING & SUBTRACTING

- Identify **LIKE TERMS**! (Same variable ***and*** same exponent)
- Add or subtract the coefficients (number in front of the variable)
- The exponents ***stay the same***!
- Watch for negative signs in front of brackets! This means you need to switch all signs in the bracket that comes **after** the minus sign.