Name: _____

Secondary 2H: UNIT 1
Lesson 1

Warm-up:

1. Simplify a. $x^2 \cdot x^4 =$ b. $\left(x^3\right)^5 =$	**2.** Rewrite the following without negative exponents a. $(5x)^{-3} =$ b. $2x^{-4} =$
3. Solve for x $5x - 3 = 12$	**4.** Multiply $x(x+4) =$

By the end of this lesson, I can…

- identify the parts of an expression, such as terms, factors, and coefficients, bases, exponents, and constant
- add and subtract polynomials. I can multiply polynomials using the distributive property, and then simplify

1.1 Algebraic Expressions and Their Parts

When we combine numbers and/or variables using addition, subtraction, multiplication, and division, we form an _____.

The _____ of an algebraic expression are those parts that are separated by addition.

$\Rightarrow$ Parts of an **algebraic expression**:

$$5x^4 + 3x^2y^3 - 2x + 4$$

Practice:

Identify the terms of each algebraic expression. If applicable, identify the constant term of the expression.

Algebraic Expression	Terms	Constant Term
$10xy + 5$		
$4h^2 - 3k^2 - 5h + 9m$		
$t^2 - 3t + \frac{1}{t}$		
$-7y^2 + 2y - 8$		

$\Rightarrow$ Parts of a **term**:

$$5x^4$$

Practice:
Identify the parts of each term.

Term	Coefficient	Base	Exponent
$9u^8$			
$\frac{5}{3}t$			
$\frac{x^4}{2}$			

1.2 Polynomials

A **polynomial** is a kind of algebraic expression. Polynomials are formed by adding and subtracting terms. They DO NOT have

Polynomials	Not Polynomials….WHY??
$x^4+4x^3-2x^2-3$	$5\sqrt{x}+2$
$-6x^5-2x+1$	$3x^{2/3}+4$
$5x^3-4$	$\frac{-1}{2x}-3x^2$

$\Rightarrow$ Parts of a **polynomial**:

$$2x^4-5x^3-7x^2-x+3$$

Practice:
Determine if the following functions are polynomials. If so, state the degree and leading coefficient.

1. $f(x)=3x^{-5}+17$
2. $f(x)=-9+2x$
3. $f(x)=\sqrt[3]{27x^3+8x^6}$
4. $f(x)=8$
5. $f(x)=3x^2+x-\frac{1}{x}$

Operations on Polynomials (Addition and Subtraction)

To add or subtract polynomials, we combine like terms.

Practice:

Simplify each expression. Write your answers in standard form. Determine if the result is a polynomial. If it is a polynomial, state the degree, leading term and leading coefficient.

1. $(x^2 - 3x + 7) + (3x^2 + 5x - 3)$

2. $(5p^2 - 3) + (2p^2 - 3p^3)$

3. $(3a^2 + 4a + 1) - (2a^2 + 7a + 4)$

4. $(x^3 - 2x^2 - 5x + 1) - (3x^3 - 8x^2 + 2x - 8)$

Operations on Polynomials (Multiplication)

To multiply polynomials, we use the distributive property.

In the next problems, remember to distribute both terms of the first expression. (In other words ….. FOIL!)

5. $(x - 3)(6x - 2)$

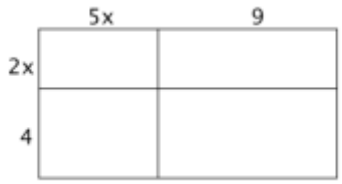
6. $(2a - 1)(8a - 5)$

7. $(2n + 2)(6n + 1)$

8. $(x - 4)(x + 4)$

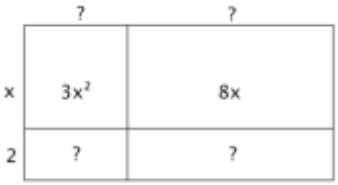
Find the area of the rectangle below in two different ways.

9.



Fill in the missing information.

10.



Recall that when we square an expression, we multiply it by itself.

So, $(x+2)^2$ is the same as _____.

Rewrite the following as a product of two expressions and then simplify.

11. $(x-3)^2$

12. $(4p-1)^2$

13. $(6k+5)^2$

Practice:
Simplify each expression.

1. $3x(2x^2+6x-5)$

2. $(x^2+4)(10x-3)$

3. $2x^2(5x-2)+3x(7x^2+2)$

4. $(5x^3-1)^2$

And, finally, something a little different. Watch your bases!

5. $5m^2(3m-2n)+4n(3m^2-n)$