Name:_____ Date:_____

8A; Algebra 1 Period_____

Addition & Subtraction of Polynomials

I. A. **Monomial** -is an algebraic expression consisting of **one term** that is a constant (a number), a variable, or the product of constants and variables.

**Remember monomials are terms whose exponents are whole numbers. The exponents may NOT be fractions, decimals or negative numbers. A monomial can NOT have a variable in the denominator.

Ex's: Monomials: -4, p, $5m^3$, $-2ab^3c$, 2n, x^3, $4a^4b^3$, 7 **NOT** monomials: $p^{2.4}$, 2^x, $\sqrt{x}$, $\frac{5}{g^2}$, $\frac{4}{3x}$, $-3x^{-4}$

B. **Polynomial**- The sum or difference of monomials.

# of terms				
Name				
Examples				

II. **Like terms**- Monomials that have the **same variables** having the **same exponents**.
Ex's: $4x^2$ & $6x^2$, 5x & 2x, $7xy^2$ & $6xy^2$. NOT like terms: 5 & 3x, $3x^2$ & $4x^3$.

****Only like terms may be combined by addition or subtraction.**

III. **Descending Power Order**- When a polynomial is written from its highest exponent to its lowest exponent ex: $2x^3 - x^2 + 4x + 4$
This is also known as **standard form.

Ex's Write the following in descending power order:
a) $4x^5 + 6x^{10} - 2x^3 + x^4$ b) $7x^3 + 6x^4 + 7x^2 - 10x^8$

IV. **Leading Coefficient**- When a polynomial is in descending power order the leading coefficient is the coefficient of the first term.

Ex's What are the leading coefficients of the following:
a) $6x^2 + 8x^3 - 4x^8$ b) $7x^4 - 3x^5$

V. **Simplest Form**- When the polynomial contains NO like terms ex: $4x^2 - 2x + 5$

VI. **Degree-**

A) Monomial: The degree is the sum of the exponents of the different variables (Add exponents)
ex: $2x^3y^4z^5$ is 3 + 4 + 5 = 12

Ex's: What is the degree of:
a) $4a^2bc^3d^5e^7$ b) $7x^5$ c) y d) 5

B) Binomial or Trinomial: The degree is the highest degree of any of its terms (highest exponent)

Ex's: What is the degree of:
a) $-4x^3 + 5x^2 - 2$ b) $6x^5 + 4x^3$

VII. **Addition of Polynomials**- Remember you can only add like terms!
Steps: 1) Write like terms under one another

2) Add like terms (keep the exponents the same)

3) Make sure your answer is in descending power order

VIII. **Subtracting Polynomials**- Remember you can only subtract like terms!
Steps: 1) Write like terms under one another and place the 2nd polynomial in parentheses

2) Distribute the negative sign to the 2nd polynomial

3) Add like terms (keep the exponents the same)

4) Make sure your answer is in descending power order

IX. **Practice**
1) Which of the following expressions cannot be simplified?

a) $3x + 6x$ b) $6y - 3y$ c) $3x + 6y$ d) $2x^2 + 7x^2$

2) Add: $3x^2 - 6x$
$\underline{x^2 + 2x}$

3) Add: $7x^2 + 3x - 5$
$\underline{-4x^2 - x + 4}$

4) Add: $4a^2 + 2ab + 3b^2$
$\underline{-a^2 - 3ab + b^2}$

5) $(x^2 + 2x) + (4x^2 + 7)$

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

7) Which of the following represents the sum of $(3x^2 - 3x + 8)$ and $(-5x^2 + 4x + 2)$

a) $-8x^2 - x + 10$

c) $2x^2 - x + 10$

b) $-2x^2 + x + 10$

d) $8x^2 - 7x + 6$

8) From $(7x^2 + 8x - 3)$ subtract $(4x^2 - 5x + 6)$

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

c) $11x^2 + 13x + 3$

b) $-3x^2 + 3x + 9$

d) $3x^2 + 13x - 9$

9) When $(4x^2 - 8x - 3)$ is subtracted from $(x^2 - 2x + 1)$ the result is

a) $-3x^2 + 6x + 4$

c) $5x^2 + 6x + 4$

b) $3x^2 + 6x - 2$

d) $-3x^2 - 6x - 2$

10) $5x^2 + 8x - (3x^2 - 2x)$

11) From $4x^2 + 3x - 3$ subtract $x^2 - 3$

12) $(2x^2 + 2x) - (8x + 7)$

13) How much less than $5x^2 - 3x + 2$ is $2x^2 + 5$?

**Challenge: 14) $4x^2 - (6x - (3x - 2x^2) + 4)$