

KEEPER #1 - Polynomial Operations

Polynomial : an expression consisting of variables and coefficients that involves only addition, subtraction, multiplication, and positive integer exponents

Examples:

Expression	Polynomial or Not?	Why?
$6x^{-2}$	This is NOT a polynomial term...	...because the variable has a negative exponent.
$\frac{1}{x^2}$	This is NOT a polynomial term...	...because the variable is in the denominator.
\sqrt{x}	This is NOT a polynomial term...	...because the variable is inside a radical.
$4x^2$	This IS a polynomial term...	...because it obeys all the rules.

Term : Each part of the polynomial being added. Made up of a coefficient and a variable multiplied together.

Degree : The degree of each term is determined by the exponent that the variable is raised to. The variable with the highest degree (degree of the leading term) determines the degree of the entire polynomial

Naming polynomials by the highest degree:

Highest Degree	Name
x^0	Constant
x^1	Linear
x^2	Quadratic
x^3	Cubic
x^4	Quartic
x^5	Quintic

Naming polynomials by the number of terms:

Amount of Terms	Name
1	Monomial
2	Binomial
3	Trinomial
4 or more	A polynomial with 4 terms, 5 terms, etc.

****A**

polynomial is in standard form when the terms are in order from highest degree all the way down to the constant

ADDITION

Keep the sign of each term.
Ignore parenthesis.
Combine like terms.
Two terms are "like" terms if they are the same variable of the same degree.

Example: $(2x + 5y) + (3x - 2y)$

$$5x + 3y$$

Example: $(2x^2 + 4x + 6) + (6x - 9)$

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

SUBTRACTION

Change the sign of each term in the second set of parenthesis.

(Distribute the negative)

Then add!

Example: $(x^3 + 3x^2 + 5x - 4) - (3x^3 - 8x^2 - 5x + 6)$

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

$$-2x^3 + 11x^2 + 10x - 10$$

Example: $(6x^3 - 2x^2 + 8x) - (4x^3 - 11x + 10)$

$$(6x^3 - 2x^2 + 8x) + (-4x^3 + 11x - 10)$$

$$2x^3 - 2x^2 + 19x - 10$$

MULTIPLICATION

Use distribution to multiply each term in the first polynomial by each term in the second polynomial.

Remember to combine like terms at the end.

Example: $(x + 3)(x + 2)$

$$x*x + x*2 + 3*x + 3*2$$

$$x^2 + 2x + 3x + 6$$

$$x^2 + 5x + 6$$

Ex: $(x + 2)(x^3 + 3x^2 + 4x - 17)$

$$x*x^3 + x*3x^2 + x*4x + x*-17 + 2*x^3 + 2*3x^2 + 2*4x + 2*-17$$

$$x^4 + 3x^3 + 4x^2 - 17x + 2x^3 + 6x^2 + 8x - 34$$

$$x^4 + 5x^3 + 10x^2 - 9x - 34$$