

Name: _____ Date: Aug 30 Hour: _____ Alg 1 _____

Unit 1B Day 9: The Building Blocks of a Polynomial

Focus Question: What is a polynomial and what are its parts?

A. Expressions

1. Give three examples of a simplified term:

$$\frac{7xy}{z}$$

$$8m$$

$$500x^5$$

$$19t^{19}$$

2. When terms are linked (using addition or subtraction), we call them expressions. The number of terms tells us what to call the expression.

# of Terms	Example	Call it a...
1	$-6x^4$	Monomial
2	$4x - 2$	Binomial
3	$2x^5 - 3x^2 + 8$	Trinomial
4 or more	$5x^3 + 2x^2 - 7x + 3$	Polynomial

All of the polynomials above are written in standard form of a polynomial because the terms go from highest degree (exponent) to lowest degree. The highest degree is called the degree of the polynomial.

3. Why is the constant last?

it doesn't have a variable with exponent (if it did, the exponent would be zero: $3x^0 \Rightarrow 3 \cdot 1 \Rightarrow 3$)

4. Fill in the table to demonstrate your knowledge of expressions.

Expression	$6x + 2 - 7x^5$	$2m^4 - 3$	$-2x^2 + 4x - 3 + 7x^8$	$7b$
# of terms	3	2	4	1
Is called a...	trinomial	binomial	polynomial	monomial
Coefficients*	6, 2, -7	2 & -3	-2, 4, -3, 7	7
Constants*	yes the 2	yes the -3	yes the -3	None
Is it in standard form? If not, write it in standard form.	No $-7x^5 + 6x + 2$	Yes	No $7x^8 - 2x^2 + 4x - 3$	Yes

Degree 5 trinomial

Degree 4 binomial

Degree 8 polynomial

* The sign goes with the number behind it. "Minus" and "negative" can be confusing because we use the same symbol to mean both words (subtraction is really just adding a negative). The first expression is said "Six x plus 2 minus seven x to the 5th" but the coefficient on the third term is "negative seven."

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

B. Simplifying Expressions (Adding and Subtracting Polynomials)

Sometimes expressions can be simplified. For example $2x + 5x + 4$ simplifies to $7x + 4$. It went from 3 terms to two terms.

like terms

Sometimes expressions cannot be simplified. For example $3x^2 + 7x + 8$ cannot be simplified. It is three terms and must remain 3 terms.

Diff. exp.

1. When someone says "combine like terms..."

"Like terms" have the same variable part (exact same variable & exponent)

And you "combine" the coefficients.

2. Explain why each expression below CANNOT be simplified:

a. $3x^2 + 6m^2$

diff. vari.

b. $5x^2 - 7x$

diff. exp.

c. $4x + 2$

var. constant

3. Simplify each expression below (use a calculator for positives and negatives!) You should always write a simplified form of the same expression underneath the original expression. It would be smart to write the entire expression in standard form first so that the like terms are next to each other.

a. $(5x^4 + 3x^2 - 4) + (7x^2 + 8x)$

$5x^4 + 3x^2 + 7x^2 + 8x - 4$

$5x^4 + 10x^2 + 8x - 4$

b. $(6x^3 - 4x + 8) - (7x + 2)$

$6x^3 - 4x - 7x + 8 - 2$

$6x^3 - 11x + 6$

c. $(-7x^5 + 14 - 2x) + (10x^4 + 7x + 5x^5)$

$-7x^5 + 5x^5 + 10x^4 - 2x + 7x + 14$

$-2x^5 + 10x^4 + 5x + 14$

d. $(3 - 6n^5 - 8n^4) - (-6n^4 - 3n - 8n^5)$

$-6n^5 + 8n^5 - 8n^4 + 6n^4 + 3n + 3$

$2n^5 - 2n^4 + 3n + 3$

e. $(7 - 13x^3 - 11x) - (2x^3 + 8 - 4x^5)$

f. $(-10k^2 + 7k + 6k^4) + (-14 - 4k^4 - 14k)$

Challenge: $(-9v^2 - 8u) + (-2uv - 2u^2 + v^2) + (-v^2 + 4uv)$