

Name: _____

Date: _____

Lesson 7-1: Introduction to Polynomials

"I can classify and simplify polynomial expressions."

Warm Up: Simplify each expression by combining like terms:

1) $4x + 2x$
 $6x$

2) $3y + 7y$
 $10y$

3) $8p - 5p$
 $3p$

4) $5n + 6n^2$
 $5n + 6n^2$

*when CLT, never change exponent!

Getting to know Polynomials EXPRESSIONS

Monomial: an algebraic expression with ONE term.

Binomial: the sum of 2 terms monomials.

Trinomial: the sum of 3 terms monomials.

Classifying Polynomials: All polynomials are classified by degree and number of terms.

Degree of a Polynomial: The degree of a polynomial is its highest exponent.

Expression	Classify the Polynomial	Degree
$4y - 5x^4z$	Binomial	4
$6x^3 + 4x^2 - 3$	Trinomial	3 (cubic)
$8a$	Monomial	1 (Linear)
$6x^2 - x + 4$	Trinomial	2 (Quadratic)
$2x^4 + 7x^2 - 5x + 21$	Polynomial	4
-6.5	monomial	constant

Standard Form of Polynomials

Terms should be written in order from highest to lowest degree. The constant should be LAST.

$4x^4 - 7 + 5x^2y + 6x^5$

Express this polynomial in standard form →

$6x^5 + 4x^4 + 5x^2y - 7$

Leading Coefficient: the coefficient of the degree term in standard form. (6 in the example)

Expression	Standard Form	Leading Coefficient
① $9x^2 + 3x^6 - 4x$	$3x^6 + 9x^2 - 4x$	3
② $12 + 5y + 6xy + 8xy^2$	$8xy^2 + 6xy + 5y + 12$	8
③ $-4y + 2 + 5y^2$	$5y^2 - 4y + 2$	5

SIMPLIFYING

Adding & Subtracting Polynomials: 1) **Distribute** 2) **CLT**

Example 1: $(18x - 2x^2 + 15) + (3x^2 - 10 - 8x)$
 $18x - 2x^2 + 15 + 3x^2 - 10 - 8x$
 $x^2 + 10x + 5$

Quadratic Trinomial
(degree 2)

Example 2: $(6x^2 + 7x) - (10x + 3x^2 + 2)$
 $6x^2 + 7x - 10x - 3x^2 - 2$
 $3x^2 - 3x - 2$

Quadratic Trinomial
(degree 2)

Part 1: Directions: Classify the following polynomials by degree and number of terms.

1) $3x + 12$ Linear Binomial	2) $-7x^2 + 4x - 1$ Quadratic Trinomial
3) $x^3 - 8$ Cubic Binomial	4) 24 (Linear) Constant Monomial
5) $2x^4 - x^3 + 5x^2 + x - 7$ Quartic Polynomial	6) $10x$ Linear Monomial

Part 2: Directions: Find the sum or difference. Answers must be in standard form.

7) $(x^2 - 4x + 3) + (3x^2 - 3x - 5)$ $x^2 - 4x + 3 + 3x^2 - 3x - 5$ $4x^2 - 7x - 2$	8) $(8x^2 - 12x + 4) - (3x^2 + 5x - 1)$ $8x^2 - 12x + 4 - 3x^2 - 5x + 1$ $5x^2 - 17x + 5$
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9) $(2x - 3 + 7x^2) - (3 - 9x^2 - 2x)$	10) $(7x^2 + 3x) - (5x^2 + 4)$
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11) $(3x^2 - x + 3) + (4x^2 - 5)$ $3x^2 - x + 3 + 4x^2 - 5$ $7x^2 - x - 2$	12) Find the sum of $2x^2 - 6x - 2$ and $x^2 + 4x$.
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13) Subtract $-a^2 - 5ab + 3b^2$ from $3a^2 - 2ab + 3b^2$. $(3a^2 - 2ab + 3b^2) - (-a^2 - 5ab + 3b^2)$	Scrambled Answers: Linear monomial $7x^2 - 2$ $4a^2 + 3ab$ $4x^2 - 7x - 2$ $3x^2 - 2x - 2$ Linear binomial Quadratic Trinomial $16x^2 + 4x - 6$ Cubic binomial Quartic Polynomial $5x^2 - 17x + 5$ $2x^2 + 3x - 4$
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