Name:	Date:	Period:

6.1 Monomials & Polynomials Review

Monomials

A monomial: a single term expression

- It can be a number, variable, or a product of numbers and constant variables.

2, x^7, $2x$, $4xy$

Examples

Directions: Simplify each expression. Use properties of exponents

1. $(-2a^3b)^2 \cdot 8ab^9$

$(-2)^2(a^3)^2b^2 \cdot 8ab^9$

$4 \cdot a^6 \cdot b^2 \cdot 8 \cdot a \cdot b^9$

$32a^7b^{11}$

2. $\left(\frac{14w^{12}}{7w^3}\right)^{-1}$

$\left(\frac{7w^3}{14w^{12}}\right)^1$ $\frac{1}{2w^9}$

Polynomials

A **polynomial** is the sum or difference of many monomials.

- The **highest power** of a polynomial is the degree of the whole polynomial.
- **Standard Form:** polynomials with the terms written in decending order of exponents (degrees)

Examples: Write in standard form

Each term has a degree

$-k^5 - 1 + 8k - 3k^3 + \frac{1}{4}k^2$

$-K^5 - 3K^3 + \frac{1}{4}K^2 + 8K - 1$

5 3 2 1 0

The degree of the polynomial is 5

$18a + 3a^3 + 5a^6 + 102a^4$

$5a^6 + 102a^4 + 3a^3 + 18a$

Degree 6

Classifying Polynomials

Degree	
0	constant
1	Linear
2	Quadratic
3	Cubic
4	quartic
5	quintic

Numbers of Terms	
1	monomial
2	binomial
3	trinomial
4+	— term polynomial

Polynomials are classified by degree and number of terms.

1. $-3x + 1$ Linear binomial
2. $9x^5 - x^4 + 2x$ quintic trinomial
3. 24 constant monomial (constant always a monomial)
4. $\frac{1}{2}x^3 - 2x^2 + 4x + 15$ cubic 4 term polynomial
5. $-x^2 - 18x + 3$ quadratic trinomial
6. $-\frac{3}{2}x^4$ quartic monomial

Adding & Subtracting Polynomials

1. COMBINE like terms (distribute the negative for subtraction!)
2. Write your answer in STANDARD FORM.

$(3x^2 + 11x + 4) + (-5x + x^2 - 13)$

$4x^2 + 6x - 9$

( ) not important to collecting like terms

$(5k^3 - 2k^2 + 2k) - (2k^2 + 2k + 17)$

$5k^3 - 2k^2 + 2k - 2k^2 - 2k - 17$

$5k^3 - 4k^2 - 17$

$-(\ )$

distribute (-1)

Multiplying Polynomials

1. MULTIPLY every term from the one group by every term in the other group.
2. COMBINE like terms.
3. Write in STANDARD FORM.

$(2c + 5d)^2$

$(2c+5d)(2c+5d)$

perfect square trinomial

$2 \cdot 2c \cdot 5d$

$4c^2 + 20cd + 25d^2$

$(2x + 1)(4 - 9x) - 2x(3x + 11)$

multiply & then add

$8x - 18x^2 + 4 - 9x - 6x^2 - 22x$

$-24x^2 - 23x + 4$

$(3m^2 - 4m + 1)(2m^2 + 5m - 9)$

$6m^4 + 15m^3 - 27m^2 - 8m^3 - 20m^2 + 36m + 2m^2 + 5m - 9$

$6m^4 + 7m^3 - 45m^2 + 41m - 9$

$(w - 7)(w^2 + 2w + 1)$

$w^3 + 2w^2 + w - 7w^2 - 14w - 7$

$w^3 - 5w^2 - 13w - 7$

$\frac{3+x}{4}$ equivalent $\frac{3}{4}+\frac{x}{4}$

Dividing Polynomials By a monomial

1. DIVIDE each term in the numerator by the monomial in the denominator. use prop. of exponents
2. Write in STANDARD FORM.

$\frac{9m^3-24m^2}{3m}$

$\frac{9m^3}{3m}-\frac{24m^2}{3m}$

$3m^2-8m$

$\frac{20x^3-4x^2-8x}{4x}$

$\frac{20x^3}{4x}-\frac{4x^2}{4x}-\frac{8x}{4x}$

$5x^2-x-2$

$\frac{30c^8d^3-36c^6d^2+6c^3d}{12c^2d}$

$\frac{30c^8d^3}{12c^2d}-\frac{36c^6d^2}{12c^2d}+\frac{6c^3d}{12c^2d}$

$\frac{5c^6d^2}{2}-3c^4d+\frac{1}{2}c$

↑

or $\frac{c}{2}$