Section 9.1: Adding and Subtracting Polynomials

Name: <u>KEY</u>

Definitions:

1.) <u>Monomial</u>: an expression that is a number, a variable, or a product of a number and one or more variables.   "one term"

Examples:

12 　　　　$-5x^2y$ 　　　　$-2K$

y 　　　　$\dfrac{c}{3}$ or $\dfrac{1}{3}c$ 　　　　$x^2y^3z^4$

＊Single term—no addition or subtraction＊

2.) <u>Degree of a Monomial</u>: the sum of the exponents of the exponents of the <u>Variables</u>.

a) $\dfrac{2}{3}x^1$ 　　　　degree = 1

b) $7x^2y^3$ 　　　　degree = $2+3=5$

c) -4 　　　　degree = $\cancel{0}$

"many"

3.) <u>Polynomial</u>: a monomial or the sum or difference of 2 or more monomials.

Examples:

$2x+5$

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

$2x^2-3x+1$

4.) <u>Standard Form of a Polynomial</u> : the degrees of its monomial terms decrease from left to right.

$$3x^4 + 5x^2 - 7x + 1$$

Degree: 4

5.) <u>Degree of a Polynomial</u> : the degree of the monomial with the ___highest___ exponent.

*you can name a polynomial by ___degree___ and ___number of terms.___

Classifying Polynomials:

Polynomial	Degree	Name using degree	# of terms	Name using # of terms
2	0	Constant	1	monomial
2x	1	Linear 1st Degree	1	monomial
$3x^2 - 2x$	2	Quadratic 2nd Degree	2	binomial
$3x^2 - 2x + 1$	2	Quadratic 2nd Degree	3	trinomial
$4x^3$	3	Cubic 3rd Degree	1	monomial
$9x^4 + 12x$	4	4th Degree	2	binomial

Write each polynomial in standard form. Then name it based on degree and number of terms.

1. $6x^2 + 7 - 9x^4$

$-9x^4 + 6x^2 + 7$

4th Degree
Trinomial

2. $3y - 4 - y^3$

$-y^3 + 3y - 4$

3rd Degree
Trinomial

3. $8 + 7v - 11v$

*Combine Like Terms first

$8 - 4v$

$-4v + 8$

1st Degree
Binomial

4. $-2x^2$

2nd Degree
Monomial

5. 5

Ø Degree
Constant
Monomial

6. $-3 + 5x^2 + 2x$

$5x^2 + 2x - 3$

2nd Degree
Trinomial

Adding Polynomials

*add <u>like</u> terms

* write in descending order of exponents

Simplify each sum:

1. $(12m^2 + 4) + (8m^2 + 5)$

$20m^2 + 9$

2. $(9w^3 + 8w^2) + (7w^3 + 2w + 4)$

$16w^3 + 8w^2 + 2w + 4$

Subtracting Polynomials

<u>Keep</u> <u>Change</u> <u>Flip</u>

3. $(v^3 + 6v^2 - v) - (9v^3 - 7v^2 + 3v)$

$v^3 + 6v^2 - v - 9v^3 + 7v^2 - 3v$

$-8v^3 + 13v^2 - 4v$

4. $(4y^2 + 5y + 1) - (6y^2 + y + 8)$

$4y^2 + 5y + 1 - 6y^2 - y - 8$

$-2y^2 + 4y - 7$