Classifying Polynomials   Name_____
Self-Guided WS

I. Tomorrow we will be adding and subtracting polynomials, in order to do that we must first learn about polynomials.   Let's start at the beginning.

> A <u>monomial</u> is a number, variable or product of numbers and variables.
> > ex: 3, x, −20y, 4x²
> Two monomials added together is called a <u>binomial</u>.
> > ex: 3 + x, 2x² − x, 3x − 2
> Three monomials added together are called a <u>trinomial</u>.
> > ex: x² + 3x − 7,   3x⁵ − 8x² + 16x
> More than three monomials added together are called a <u>polynomial</u>.
> > ex: −3x³ + 2x² − 7x + 4, x⁵ − 4x³ + 3x² − 6x − 12

Classify (name) the following polynomials by number of terms.

1. $3x-5$ 2. $6x^3-5x+2$ 3. $4x^4-3x^7+4x^2+x-2$

4. $2x^3$ 5. $5x^5-13x+271$ 6. $144x^4-9$

II. We also classify polynomials by degree.

The largest exponent of a polynomial determines the <u>degree</u> of the polynomial.

- If the largest exponent is zero it is called <u>constant</u>.   Ex. 12x⁰ = 12
- If the largest exponent is 1 it is called <u>linear</u>. Ex: 3x
- If the largest exponent is 2, it is called <u>Quadratic</u>. Ex: 4x²
- If the largest exponent is 3, it is called <u>Cubic</u>. Ex: 3x³
- If the largest exponent is 4, it is called <u>Quartic</u>. EX: 2x⁴
- If the largest exponent is n, it is called nth degree. Ex: 3xⁿ

Classify (name) the following polynomials by degree.

7. $3x-5$ 8. $6x^3-5x+2$ 9. $x-2$

10. $2x^3$ 11. $5x^2-13x+271$ 12. $144x^4-9$ 13. **51**

14. Complete the following table:

Polynomial	Leading Coefficient	Degree 0, 1, 2, 3	Classify by Degree	Classify by Number of Terms
$3x^2 + 5x - 7$				
$2x^3$				
$x^3 - 4x^2$				
$3x^3 + 2x^2 - 1$				
6				
$-4x$				
-123				
$2x + 5$				
$3x^2$				
$3x^2 - 4$				

III. The order of a polynomial is important. We organize a polynomial in <u>standard form</u> which means that the terms are placed in descending order from largest degree to smallest degree.

Ex: $7x^5 - 3x^4 + x^3 - 2x^2 + 4x - 12$

15. Circle the following polynomials that are ordered in standard form. Rewrite the others in standard form.

$1 - 2x$ $4x - 2$ $3x^2 - 3x - 3$ $4x^3 - 2x^4 + 6$

$6x^6 - 2x$ $5x^5 - 8x^4 - 3x^2 + 4x^3 - 1$ $5x^2 - 3x + 2$