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 monomial is a number, variable or product of numbers and variables.
ex: 3, x, $-20y$, $4x^2$
Two monomials added together is called a binomial.
ex: $3 + x$, $2x^2 - x$, $3x - 2$
Three monomials added together are called a trinomial.
ex: $x^2 + 3x - 7$, $3x^5 - 8x^2 + 16x$
More than three monomials added together are called a polynomial.
ex: $-3x^3 + 2x^2 - 7x + 4$, $x^5 - 4x^3 + 3x^2 - 6x - 12$

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 degree of the polynomial.

- If the largest exponent is zero it is called constant. Ex. $12x^0 = 12$
- If the largest exponent is 1 it is called linear. Ex: $3x$
- If the largest exponent is 2, it is called Quadratic. Ex: $4x^2$
- If the largest exponent is 3, it is called Cubic. Ex: $3x^3$
- If the largest exponent is 4, it is called Quartic. EX: $2x^4$
- If the largest exponent is n, it is called n^{th} degree. Ex: $3x^n$

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: (The first row has been done for you)

Polynomial	Leading Coefficient	Degree 0, 1, 2, 3	Classify by Degree	Classify by Number of Terms
$3x^2 + 5x - 7$	**3**	**2**	**Quadratic**	**Trinomial**
$2x^3$				
$x^3 - 4x^2$				
$3x^3 + 2x^2 - 1$				
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: $7x^5 - 3x^4 + x^3 - 2x^2 + 4x - 12$

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

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

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