

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. $3x - 5$

binomial

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

trinomial

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

polynomial with 5 terms

4. $2x^3$

monomial

5. $5x^5 - 13x + 271$

trinomial

6. $144x^4 - 9$

binomial

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. $3x - 5$

linear

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

Cubic

9. $x - 2$

linear

10. $2x^3$

cubic

11. $5x^2 - 13x + 271$

quadratic

12. $144x^4 - 9$

quartic

13. 51

constant

14. Complete the following table:

Polynomial	Leading Coefficient	Degree 0, 1, 2, 3	Classify by Degree	Classify by Number of Terms
$3x^2 + 5x - 7$	3	2	Quadratic	trinomial
$2x^3$	2	3	Cubic	monomial
$x^3 - 4x^2$	1	3	Cubic	binomial
$3x^3 + 2x^2 - 1$	3	3	Cubic	trinomial
6	N/A	0	Constant	monomial
$-4x$	-4	1	linear	monomial
-123	N/A	0	Constant	monomial
$2x + 5$	2	1	linear	binomial
$3x^2$	3	2	Quadratic	monomial
$3x^2 - 4$	3	2	Quadratic	binomial

III. The order of a polynomial is important. We organize a polynomial in standard form 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.

$1 - 2x$

$-2x + 1$

$4x - 2$

$3x^2 - 3x - 3$

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

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

$6x^6 - 2x$

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

$5x^2 - 3x + 2$

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