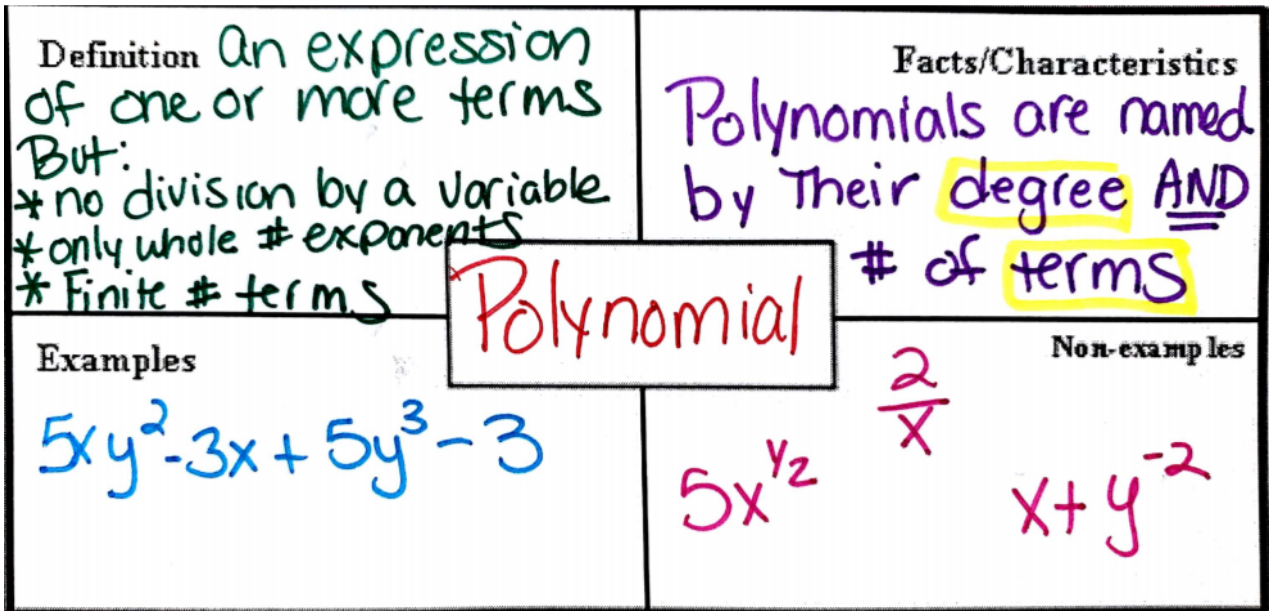
Introduction to Polynomials


Definition
An expression of one or more terms
But:
* no division by a variable
* only whole # exponents
* Finite # terms
Facts/Characteristics
Polynomials are named by their degree AND # of terms
Polynomial
Examples
$5xy^2-3x+5y^3-3$
Non-examples
$\frac{2}{x}$
$5x^{y_2}$
$x+y^{-2}$

Monomial

- A numeral, variable, or combination of numeral & one or more variables. 1 term
- Monomial with no variable is called a constant.
- Which of the following are monomials?

7 yes

$3xy$ yes

$x - y$ No b/c it has 2 terms

Coefficient

- Numeral factor in a monomial
- Give the coefficient of each:

$-ab$ $\quad -1$

$\frac{2x}{3} = \frac{2}{3} \times$ $\quad \frac{2}{3}$

$\frac{mn}{4}$ $\quad \frac{1}{4}$

h $\quad 1$

Degree of a Monomial

- Sum of the exponents of the variables.
- Find the degree of each:

$3x^5y^1$

5+1

degree = 6

$-2xyz$

1+1+1

degree = 3

54

x^0

degree = 0

Polynomials

- Example:

Degree of polynomial is the same as the term with the greatest degree

$3x^4 - 2x^3 - x^2 + 8x - 9$

4 3 2 1 0

the whole polynomial has a degree of 4

$3x^5y^2 - 2x^4y + x^3 + 6$

7 5 3 0

degree = 7

Polynomials can be named by their degree:

Polynomials are named according to their degree and number of terms.

For a polynomial with one variable, the degree is the lrgst degree of that variable.

Degree	Name	Example
0	Constant	3
1	Linear	$2x+1$
2	Quadratic	x^2-4x
3	Cubic	$2x^3-x+4$
4	Quartic	$3x^4-5$
5	Quintic	$x^5+3x-10$
6+	6^{th} degree.	x^6

Classify by number of Terms

Terms are always Separated by add & Subtract

Terms	Name	Example
1	Monomial	$3x$
2	Binomial	$x-4$
3	Trinomial	x^2+2x+3
4+	4 term Polynomial	x^6+x^2+x+10

Let's Practice! Name the following polynomials:

$-7 + 3n^3$ Cubic binomial

5 Constant monomial

$-x^4 + 3x^2 - 11$ Quartic Trinomial

Classify by degree & # terms

$5x^4$

Quartic monomial

$3x^2 - 2x^3 - 7$

Cubic trinomial

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

$3x^5 - x^3$ simplify first!

Quintic binomial

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

$3x^2$

Quadratic monomial