U2D3 **Polynomials**

Definitions:

Term: A term has a *number* (called a numerical coefficient) and may have a *letter(s)* (called a variable(s)) and possibly *exponents* on the variables. The number and letter(s) are *multiplied or divided* together.

Examples: x (this term has a coefficient of 1), 17 (this is called a constant term since there is no variable), 0, $\frac{-x}{y}$, 3n, $\frac{7}{3}x^4$, $-12x^2y^3z$

Variable(s): The letter(s) in a term are called variable(s).

Variable-Part: The letter part in a term is the variable-part. (Just remove the coefficient from the term to get the variable-part.)

Coefficient: The number in front of the variable-part of a term is the coefficient. (Short for numerical coefficient.)

Like Terms: Terms that have exactly the same variable-part are called like terms.

(Same letter(s) with the same exponent(s)).

Examples: 3x,4x $12x^2$, $7x^2$ $-15x^3yz$, $7x^3yz$ $6xy^2$,$7y^2x$

($7y^2x = 7xy^2$… we write the letters alphabetically to make it easier to identify like terms… note : $4x^2y$ is not like $6xy^2$.)

Unlike Terms: Terms that are not "like".

Examples: 3x, $3x^2$ $7x^2y$, $8xy^2$ $7x^2y$, 7n

Polynomials: A polynomials is any number of unlike terms added or subtracted together. A single term may also be a polynomial.

SPECIAL POLYNOMIALS: Polynomials are classified according to the number of terms they contain.

Name	**Number of Unlike Terms**	**Example(s)**
Monomial	One	$4n^5$ or $2x+3x=5x$
Binomial	Two	$3x^2-9x$
Trinomial	Three	$14x^3+7x^2-xy$

If a polynomial contains more than three terms, it is just classified as an n-term polynomial. For example, a polynomial with 7 terms is classified as a 7-term polynomial – it does not have a 'special' name.

Degree of a Term: To find the degree of a term, add up all the exponents on all the variables in the term.

Term	Sum of Exponents	Degree of Term
$5x^2$	2	2
4	0	0 (the degree of a constant term is always zero)
2^2	0 (there are no variables – we only count up exponents on variables)	0
$3x^2y$	2+1=3	3
$-4x^3y^8z^2$	3+8+2=13	13
7x	1 (The exponent on x is one)	1

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Degree of a Polynomial: To find the degree of a polynomial, find the degree of each term in the polynomial. The highest of those is the degree of the polynomial.

Polynomial	Degree of the terms	Degree of the Polynomial
$5x^2y$	3	3
$2x-7x^8$	1, 8	8
$4xy-7x^3y^2+5x^4-2$	2, 5, 4, 0	5

Example: Complete the following chart.

Term	Coefficient	Variable(s)	Variable-part	Degree
3xy	3	x,y	xy	2
$-139x^5y^2$	-139	x,y	x^5y^2	7
ab	1	a,b	ab	2
-11	-11	----- (there are no variables - this is a "constant" term	----- (there is no variable-part)	0
-ab	-1	a,b	ab	2
$\frac{7x^4}{3}$	$\frac{7}{3}$	x	x^4	4