

Unit 2

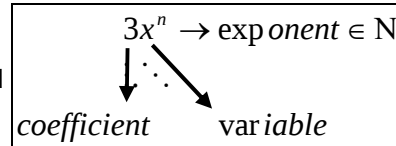
Algebraic Expressions

Monomial : is an algebraic expression with 1 term. It can be:

- A constant: 5 ; -3 ; $\frac{1}{2}$
- A variable: a ; x ; t
- A product: $2a$; $-4x^2$; $3xy$; $\frac{1}{2}x^2y$

Note: the exponent must be a natural number. i.e. $3x^{-2}$; $\frac{3}{x^2}$; $5x^{1/3}$; $2\sqrt{x}$ are not monomials

Coefficient: is the factor by which a variable is multiplied



Note: if the coefficient is 1, it is not written, for example: $ab = 1ab$; $-1x^2 = -x^2$

Like terms: are terms with identical variables and identical exponents (not coefficients)

Examples: 6 and -2 ; $3a$ and $4a$; $-2a^3b^2$ and $5a^3b^2$; $0.5xy^5$ and $10xy^5$

The Degree of a term is the sum of the exponents of the variables.

Examples: 3 degree 0
 $3x$ degree 1
 $3x^2$ or $3xy$ degree 2
 $3x^2y$ degree 3
 $3x^2y^3$ degree 5 etc.

To find the numerical value of an algebraic expression we replace the variable by the given value.

Examples: $4x^3$ if $x = 2$; $2a^2$ if $a = -3$; $2x^3y^2$ if $x = 2$; $y = -3$
 $=4(2)^3$; $=2(-3)^2$; $=2(2)^3(-3)^2$
 $=4(8)$; $=2(9)$; $=2(8)(9)$
 $=32$; $=18$; $=144$

Binomial: is an algebraic expression with 2 terms.

Examples: $3x + 2$; $2a^2 + 3a$; $4ab - 2a$

Trinomial: is an algebraic expression with 3 terms.

Examples: $2a^2 + 3a + 5$; $b^3 - 2b + 5$; $2x^2 - 6xy + 7y$

Polynomial: is an algebraic expression with 1 or more terms, separated by $+/ -$, and the terms are written in decreasing order of powers.

The degree of a polynomial: is the degree of the term with the highest degree.

Example: $3x^2y^2 + 4xy^2$ has degree 4

Simplifying an algebraic expression means representing it using as few terms as possible (collecting like terms)

The **Zero** of a polynomial is the value of the variable which makes the polynomial equal to zero