

Polynomial Expressions

A polynomial expression $S(x)$ in one variable x is an algebraic expression in x term as

$$S(x) = a_n x^n + a_{n-1} x^{n-1} + a_{n-2} x^{n-2} + \dots + ax + a_0$$

Where $a_n, a_{n-1}, \dots, a, a_0$ are constant and real numbers and a_n is not equal to zero

Some Important point to Note

S.no	Points
1	$a_n, a_{n-1}, a_{n-2}, \dots, a_1, a_0$ are called the coefficients for $x^n, x^{n-1}, \dots, x^1, x^0$
2	n is called the degree of the polynomial
3	when $a_n, a_{n-1}, a_{n-2}, \dots, a_1, a_0$ all are zero, it is called zero polynomial
4	A constant polynomial is the polynomial with zero degree, it is a constant value polynomial
5	A polynomial of one item is called monomial, two items binomial and three items as trinomial
6	A polynomial of one degree is called linear polynomial, two degree as quadratic polynomial and degree three as cubic polynomial



Important concepts on Polynomial

Concept	Description
Zero's or roots of the polynomial	It is a solution to the polynomial equation $S(x)=0$ i.e. a number "a" is said to be a zero of a polynomial if $S(a) = 0$. If we draw the graph of $S(x) = 0$, the values where the curve cuts the X-axis are called Zeros of the polynomial
Remainder Theorem's	If $p(x)$ is an polynomial of degree greater than or equal to 1 and $p(x)$ is divided by the expression $(x-a)$, then the remainder will be $p(a)$
Factor's Theorem's	If $x-a$ is a factor of polynomial $p(x)$ then $p(a)=0$ or if $p(a) = 0$, $x-a$ is the factor the polynomial $p(x)$

