

Chapter 02 Polynomials

What is inside?

- Introduction
- Geometrical Meaning of the Zeroes of a Polynomial
- Relationship between Zeroes and Coefficients of a Polynomial
- Division Algorithm for Polynomials
- Summary

$$y(x) = y = \boxed{P(x)} = x^2 + 2x + 2 \quad \checkmark$$

P is a polynomial in the variable ' x '

degree -1 $\leftarrow \begin{matrix} 5 \\ x^1 + 2 \end{matrix} \rightarrow \begin{matrix} \text{Constant polynomial} \rightarrow \text{a poly of deg 0} \\ \text{linear polynomial} \rightarrow \text{a poly of deg 1} \end{matrix}$

degree -2 $\begin{matrix} 2 \\ x^2 \end{matrix} + 2x^1 + 3 \rightarrow \text{quadratic polynomial} \rightarrow \text{a poly of deg 2}$

degree -3 $\begin{matrix} 3 \\ x^3 \end{matrix} + 4x^2 + 2x + 3 \rightarrow \text{Cube polynomial} \rightarrow \text{a poly of deg 3}$

$4x^4 + 5x^3 + 5 \rightarrow \text{bi-qu} \rightarrow \text{a poly of deg 4}$

What are not polynomial:

$$\frac{1}{x+1}, \quad \sqrt{x+2} \rightarrow x^{1/2} + 2, \quad \sin(x^2+2) \rightarrow \text{not polynomial}$$

General defn of a polynomial:-

any expression which is of the form,

$$P(x) = a_0 + a_1x + a_2x^2 + \dots + a_nx^n$$

\therefore a polynomial, of degree n , if $a_n \neq 0$.