

## Polynomials 2

**General form:-**

- 1 Linear  $\rightarrow ax + b$
- 2 Quadratic  $\rightarrow ax^2 + bx + c$
- 3 Cubic  $\rightarrow ax^3 + bx^2 + cx + d$
- 4 Biquadratic  $\rightarrow ax^4 + bx^3 + cx^2 + dx + e$

Degree  $\rightarrow$  Highest power

Real coefficients

**Zero of the Polynomial** :-  $x$  की वो value जिसे put करने से 0 आ जाए ।

**Represent the zeroes by** :-  $\alpha$        $\beta$        $\gamma$   
alpha      Beta      Gamma

**Relation between the zeroes & coefficients** :-

$\alpha$        $\beta$        $a$        $b$        $c$

(Quadratic)  
 $ax^2 + bx + c$

coefficients

$$S = \alpha + \beta = -\frac{b}{a}$$

$$P = \alpha \cdot \beta = \frac{c}{a}$$

Relation between the zeros & coefficients :-

(Cubic)

$$ax^3 + bx^2 + cx + d$$

Diagram showing the relationship between zeros ( $\alpha, \beta, \gamma$ ) and coefficients ( $a, b, c, d$ ) for a cubic polynomial:

Sum of zeros:  $S = \alpha + \beta + \gamma = -\frac{b}{a}$

Sum of products of zeros taken two at a time:  $S.P. = \alpha\beta + \beta\gamma + \gamma\alpha = \frac{c}{a}$

Product of zeros:  $P = \alpha\beta\gamma = -\frac{d}{a}$

Find ? Quadratic Polynomial :-

$$K(x^2 - Sx + P)$$

Find ? Cubic Polynomial :-

$$K(x^3 - Sx^2 + S.Px - P)$$

Division Algorithm for Polynomials :-

$$\begin{array}{r} q(x) \\ \underline{g(x) \overline{) p(x)}} \\ r(x) \end{array}$$

$$p(x) = g(x) \times q(x) + r(x)$$