#Polynomials#

#Class-9th

Combination of Constant and variable.
⇒ Power on variables be Non-Negative Integers.

Example- $p(x) = ax^2+bx+c$

Here max^m power on $x = 2$
So, called two Degree polynomial.
& this having 3-term, so called trinomial.

Zero of polynomial

Let $p(x)$ be a polynomial. If $p(\alpha)=0$, then we say that α is a zero of the polynomial $p(x)$.

Note:- finding the Zeros of polynomial $p(x)$ means solving the equation $p(x)=0$.

factor Theorem

Let $f(x)$ be a polynomial of degree $n>1$ and Let α be any real Number.

(i) If $f(\alpha)=0$ then $(x-\alpha)$ is a factor of $f(x)$.

(ii) If $(x-\alpha)$ is a factor of $f(x)$ then $f(\alpha)=0$.

factorisation (Based on following formula)

1. $(a+b)^2 = a^2+b^2+2ab$
2. $(a-b)^2 = a^2+b^2-2ab$
3. $(a+b+c)^2 = a^2+b^2+c^2+2ab+2bc+2ca$.

(4) $(a+b)^3 = a^3+b^3+3ab(a+b)$

(5) $(a-b)^3 = a^3-b^3-3ab(a-b)$

(6) $a^2-b^2 = (a+b)(a-b)$

(7) $a^3+b^3 = (a+b)(a^2-ab+b^2)$

(8) $a^3-b^3 = (a-b)(a^2+ab+b^2)$

Important

(1) $a^3+b^3+c^3 = 3abc$ if $a+b+c=0$

(2) if $a+b+c \neq 0$ then
$a^3+b^3+c^3 = (a+b+c)(a^2+b^2+c^2-ab-bc-ca)$

Important factorisation

$P(x) = x^3+13x^2+32x+20$

By factorisation method.

solution put $x=-1$ and check this is factor or not?

$P(-1) = (-1)^3+13(-1)^2+32(-1)+20$

$= -1+13-32+20$ $\therefore (x+1)$ is a factor.

$= -33+33 = 0$

$P(x) = x^3+13x^2+32x+20$

$P(x) = x^3+x^2+12x^2+12x+20x+20$

$= x^2(x+1)+12x(x+1)+20(x+1)$

$= (x+1)(x^2+12x+20)$

$= (x+1)\{x^2+10x+2x+20\}$

$= (x+1)\{x(x+10)+2(x+10)\}$

$= (x+1)(x+10)(x+2)$ factorise.