UDAAN

2026

POLYNOMIALS

MATHS LECTURE-1

BY-RITIK SIR

Topics *to be covered*

A Meaning of Polynomials

B Types of Polynomials

C Zero of a Polynomials

D General Form of a Polynomials

E Geometrical Meaning of Zero of a Polynomials

next class!!

RITIK SIR

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Constants and Variables

$2, -2, \pi,$
$\frac{3}{2}, \frac{100}{21}, 3.14,$
$3.142857\ldots\ldots$

vary → change.

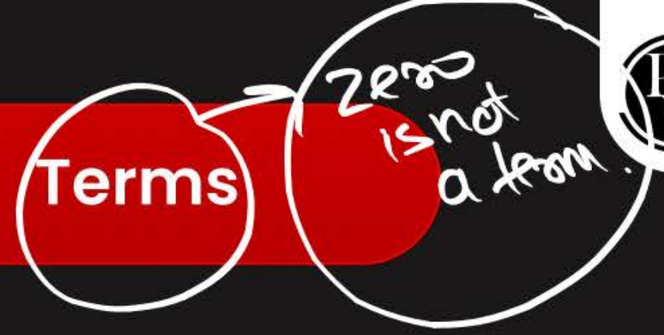
$x, y, z, \alpha, p\ldots$

Algebraic Expression

Collection of terms.

$\rightarrow x + 2$
$\rightarrow x^2 + y^2 - 2x + 3$

Terms



The non-zero part of an algebraic expression separated by + or – sign are called the terms.

V	C.V	V.V
x	$2x$	$x^2 = x \times x$
	$-3x$	x^2y^2
	$\frac{5}{2}x$	$2x^2y^2$
		$-2xy$

Polynomials

Special A.E

non-negative integer

Aise algebraic expressions jisme Variable ki power whole number hoti hai, unko (polynomials) kehte hain.

- $3x + 5$ ✓
- $3x^2 - 5x + 4y + 2$ ✓
- $3x^{-1} + 5x + 2$ ✗
- $x + \frac{1}{x} = x + x^{-1}$ ✗
- $\frac{x^{3/2}}{x^{1/2}} = x^{\frac{3}{2}-\frac{1}{2}} = x^{\frac{2}{2}} = \boxed{x^1}$ ✓

#Q. Which of the following is a polynomial?

A $2x^2 + \frac{3}{x} - 5$

B $-3x^2 + \sqrt{2x} + 4$

C $\sqrt{2}x^3 + \sqrt{3}x^2 + \sqrt{5}x - 3$

D $\frac{5}{x^3} + 2x^2 - 3x + \frac{1}{7}$

Degree of a Polynomials

Highest power of variable ko degree kehte hai.

$3x^2 - 5x + 2$ d = 2

$-4x^4 + 5x^2 - 3x$ d = 4

$5x^4 - 2x + 3x - 5x^4$ d = 1

$1x^1$

#Q. Which of the following expression are polynomials? In case of a polynomial write its degree?

(i) $x^3 - 5x + 2$ ✓ d = 3

(ii) $y^2 + \sqrt{2}y - \sqrt{5}$ ✓ d = 2

(iii) $2\sqrt{x} + 7$ ✗

(iv) -6 ✓ d = 0

(v) $4t^2 + \frac{1}{6}t + 2\sqrt{3}$ ✓ d = 2

(vi) $z^2 + \frac{5}{z^2} + 1$ ✗

(vii) $1 - \sqrt{5}\,x$ ✓ d = 1

(viii) $\frac{6\sqrt{x}+x^{3/2}}{\sqrt{x}}$

$\frac{1+2}{3} = \frac{1}{3} + \frac{2}{3}$

(viii) $\frac{6\sqrt{x}+x^{3/2}}{\sqrt{x}}$

$= \frac{6\sqrt{x}}{\sqrt{x}} + \frac{x^{3/2}}{\sqrt{x}}$

$= 6 + \frac{x^{3/2}}{x^{1/2}}$

$= 6 + x^{\frac{3}{2}-\frac{1}{2}}$

$= 6 + x^{\frac{2}{2}}$

$= 6 + x^1$ ✓ d = 1

#Q. Write:

(i) The coefficient of x^3 in $x + 3x^2 - 5x^3 + x^4$ -5

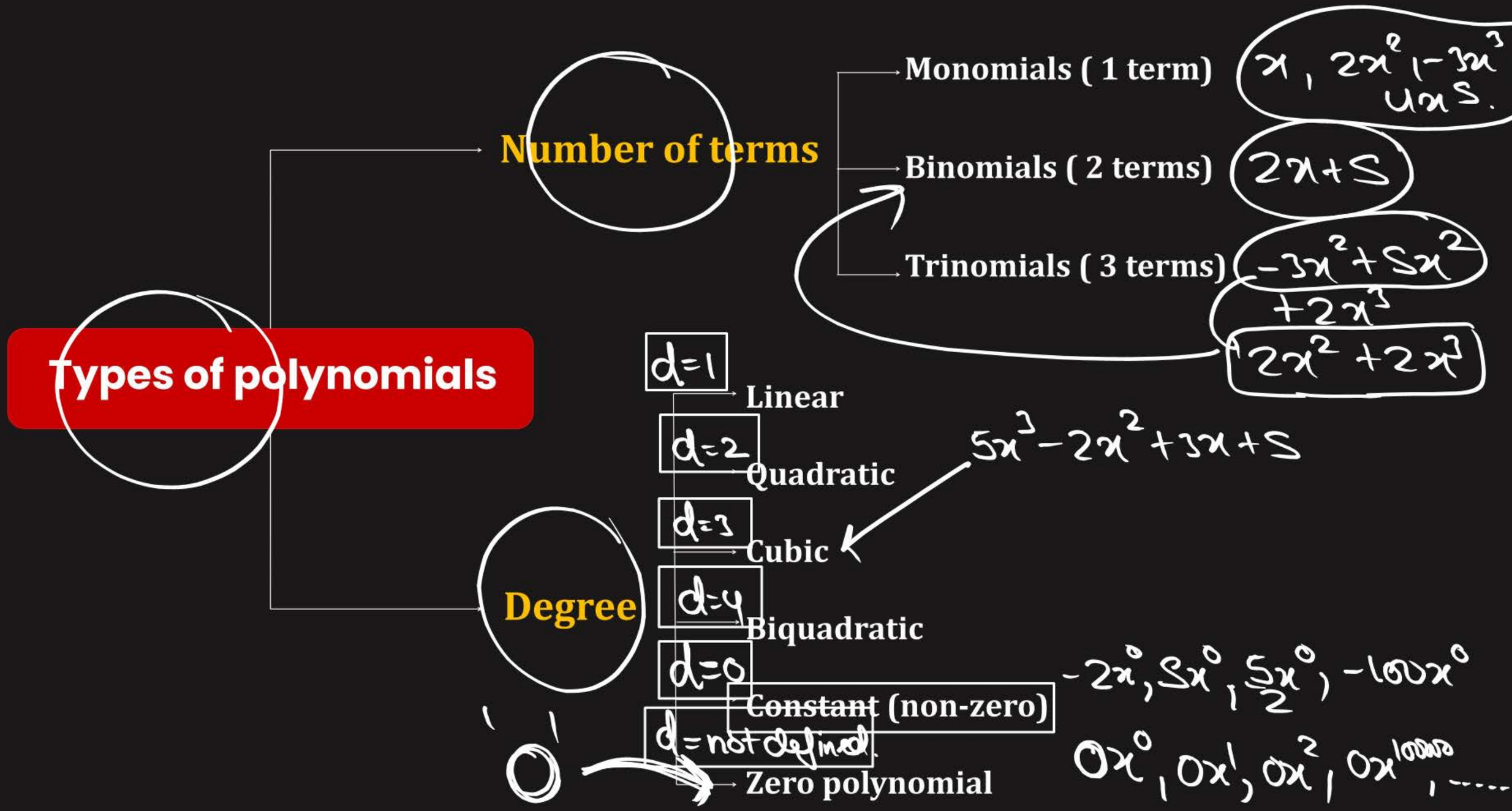
(ii) The coefficient of x in $\sqrt{3} - 2\sqrt{2} + 6x^2 + 0x$ 0

(iii) The coefficient of x^2 in $3x - 3 + x^3$ 0

(iv) The constant term in $\frac{\pi}{2}x^2 + 7x - \frac{2}{5}\pi$ — Constant term.

Q $-x^2 + 3x^2 + 5x^3 + 2x^2 = 5x^3 + 4x^2$

'C' of $x^2 = 4$


Types of polynomials
Number of terms
Monomials (1 term)
x, $2x^2$, $-3x^3$, ... and so on.
Binomials (2 terms)
$2x+5$
Trinomials (3 terms)
$-3x^2+5x^3+2x^3$
$2x^2+2x^3$
Degree
$d=1$
Linear
$d=2$
Quadratic
$d=3$
Cubic
$5x^3-2x^2+3x+5$
$d=4$
Biquadratic
$d=0$
Constant (non-zero)
$-2x^0, 5x^0, \frac{5}{2}x^0, -100x^0$
$d=$ not defined
Zero polynomial
$0x^0, 0x^1, 0x^2, 0x^{1000}, \ldots$

Value of a polynomial

- The value of a polynomial p(x) at $x = \alpha$ is obtained by putting $x = \alpha$ in p(x) and it is denoted by $p(\alpha)$.

$g(x) = 3x^2$ — quadratic monomial.

$P(x) = x + 5$ — linear binomial.

$P(1) = 1 + 5 = 6$

$P(-1) = -1 + 5 = 4$

$P(0) = 5$

$P(-5) = 0$

$P(100) = 105$

Zero = −5

$g(0) = 0$

$g(-2) = 12$

$g(3) = 27$

Zero = 0

$F(x) = -5x + 2$

$F\left(\frac{2}{5}\right) = -\cancel{5} \cdot \frac{2}{\cancel{5}} + 2 = 0$

$F(0) = -5(0) + 2 = 0 + 2 = 2$

Zero = 2/5

Zero of the Polynomial

Variable ki value

Poly = 0

(1) $p(x) = -2 + x$

Zero = 2

(2) $f(x) = 5x - 3$

$5x - 3 = 0$

$5x = 3$

$x = 3/5$

Zero = 3/5

(3) $g(x) = ax + b$

$ax + b = 0$

$ax = -b$

$x = -\frac{b}{a}$

Zero = $-b/a$

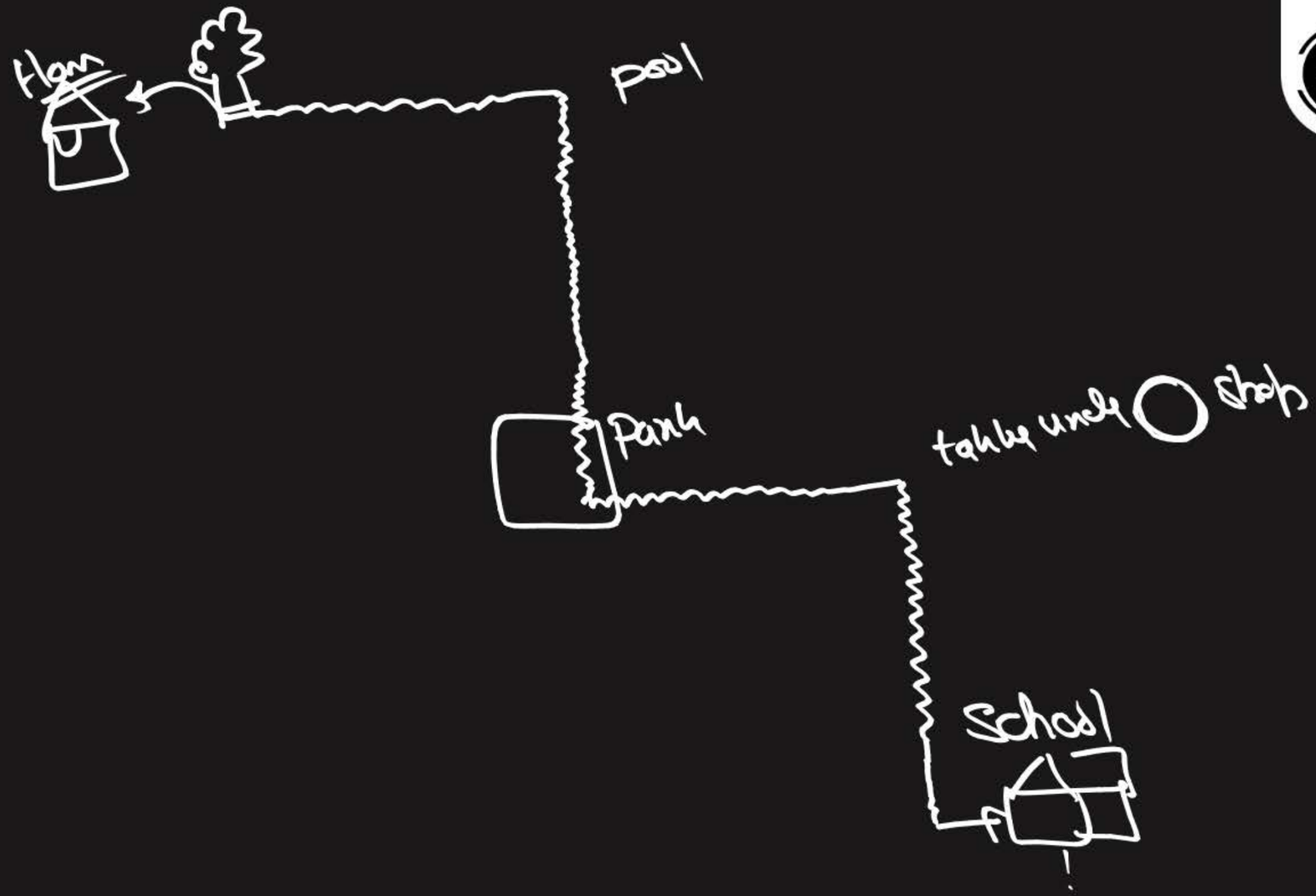

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tabla wala
shop
School

$f(x) = x - 5$ → linear p'

zero = 5

$F(x) = x^2 - 4$

zero = 2, -2

$g(x) = x^2$

zero = 0

no. of zeroes = 1, 1

Number of Zeroes of any Polynomial

Maximum = almost

d = 1

Linear Polynomial [Only 1 zero]

d = 2

Quadratic Polynomial [Maximum 2 zeroes]

d = 3

Cubic Polynomial [Maximum 3 zeroes]

d = 7 → Maximum 7

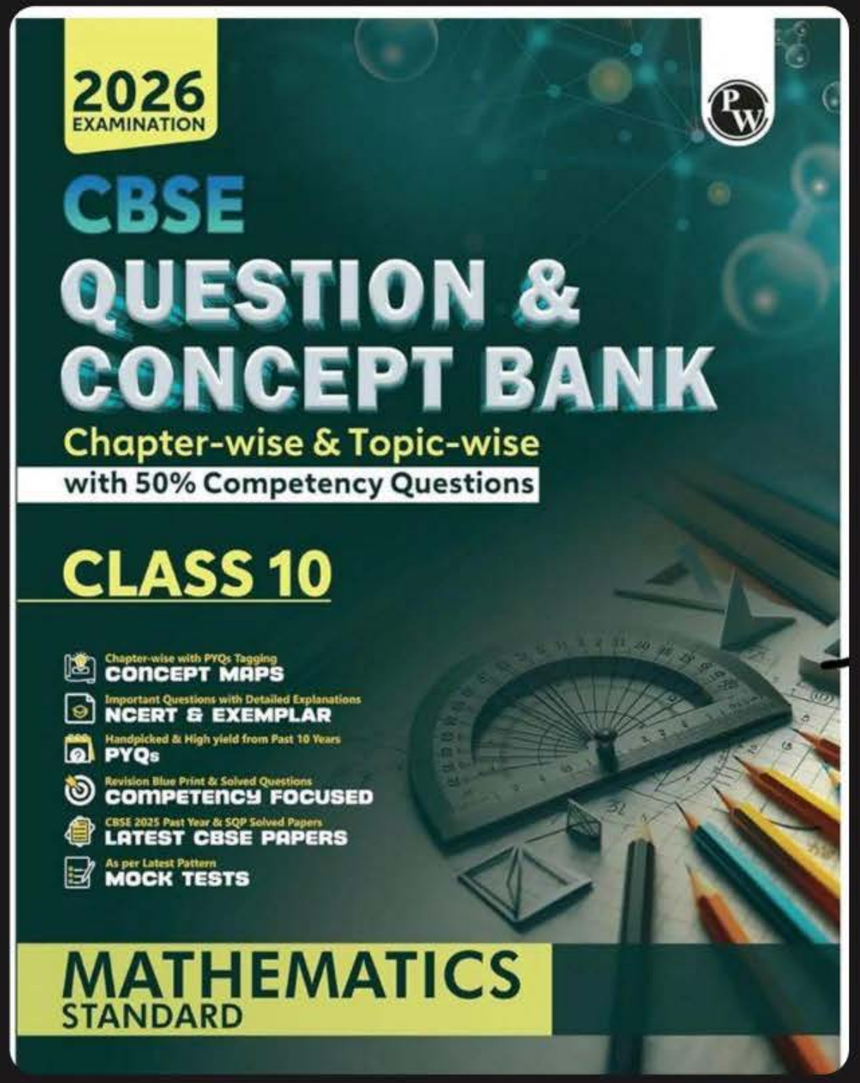
Some Important Observations

(i) A constant polynomial does not have any zero

(ii) Every linear polynomial has one and only one zero.

(iii) 0 may or may not be the zero of a given polynomial

(iv) Number of zero of a polynomial cannot exceed its degree.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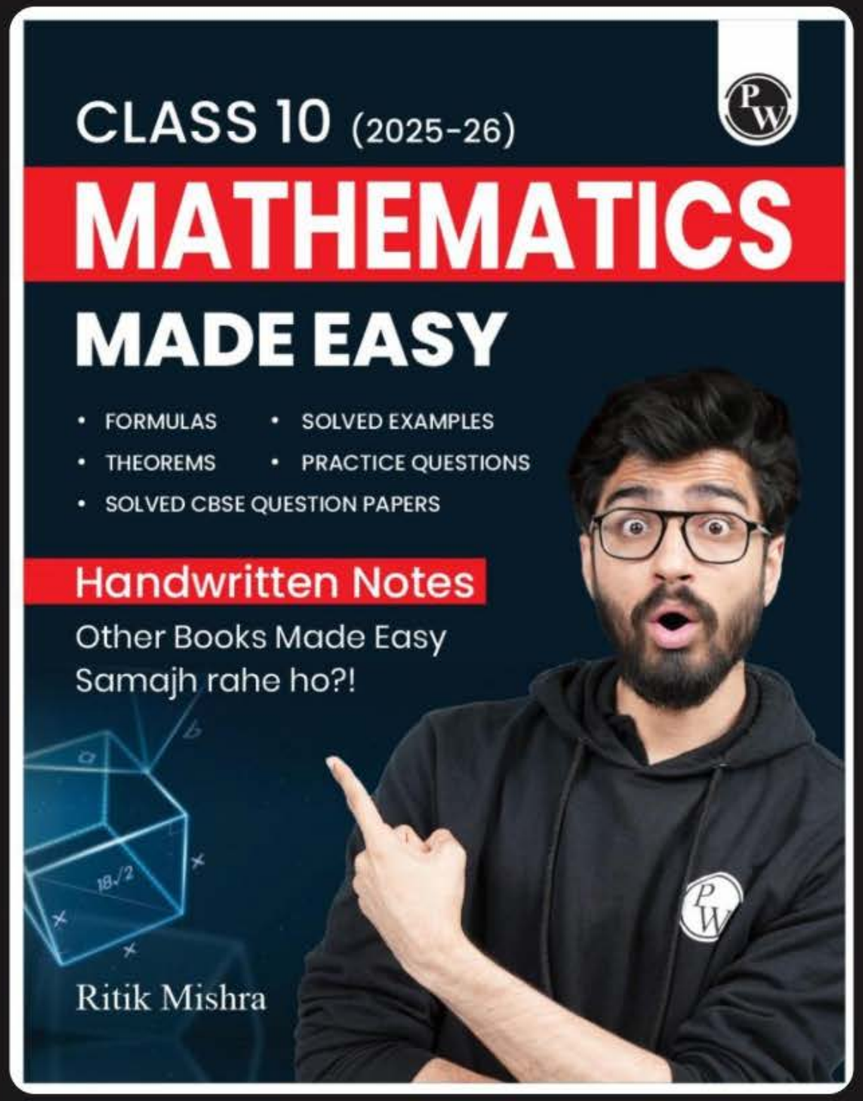
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NEVER GIVE UP

Thank You