



# The world of numbers

Lecture - 04

**CLASS-9<sup>TH</sup>**

**MATHS**

**Ritik Sir**



# Topics To Be Covered

1

Decimal expansion into  $P/Q$  form.

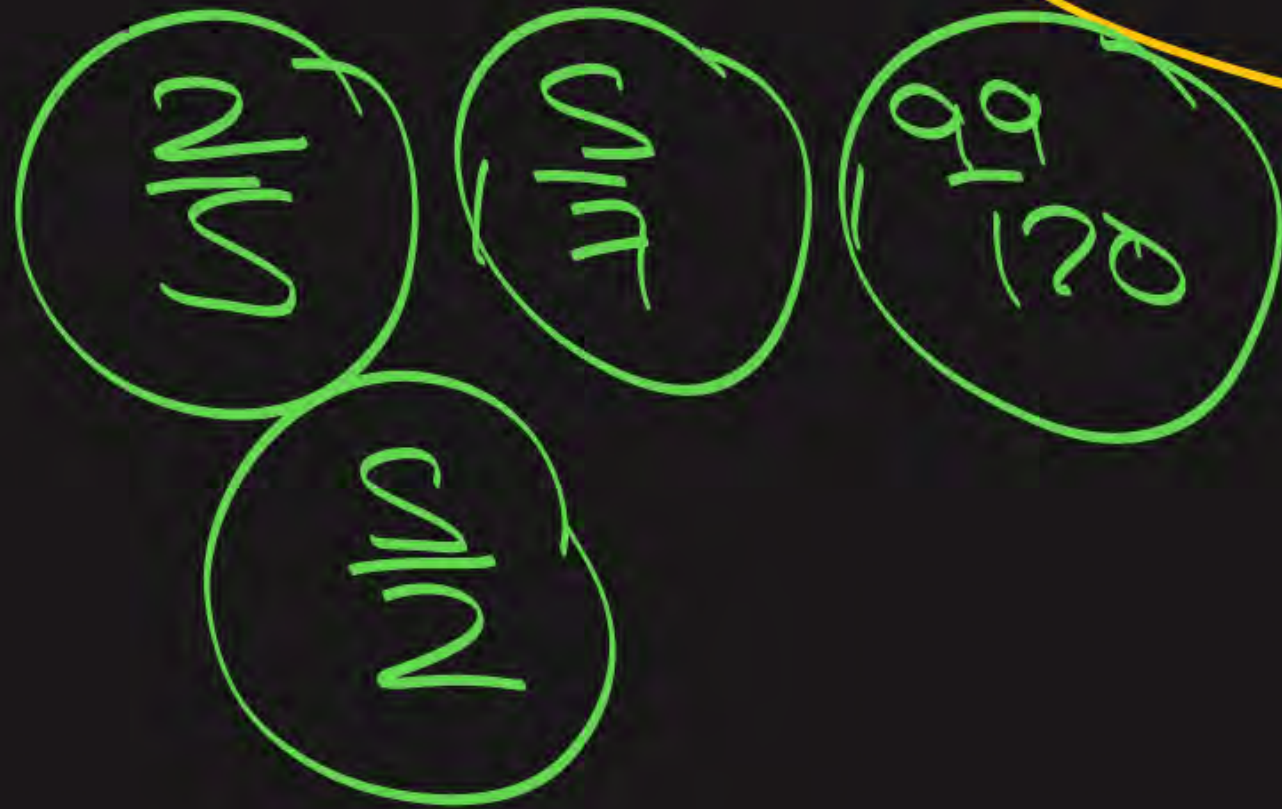
# The world of numbers

## Lecture - 4

Rational  
No

Terminating.

0.5, 3.125,  
1.67.



N.T.R.

0. $\overline{12}$  → pure  
2. $\overline{32}$  → Mixed.

# TERMINATING DECIMAL $\longrightarrow$ P/Q

0.125

0.125

0.125  
1000

~~125~~ 250  
1000

250

400

=  $\frac{1}{8}$

# TERMINATING DECIMAL $\longrightarrow$ P/Q

0.0120

0.0120

00120  
10000

120  
10000

1263  
~~1000~~  
~~500~~  
250

3  
250

# TERMINATING DECIMAL $\longrightarrow$ P/Q

$$12.6$$

$$= 12.6$$

$$= \frac{126}{10}$$

$$= \frac{63}{5}$$

# TERMINATING DECIMAL $\longrightarrow$ P/Q

15.375

$$\begin{aligned}
 &= 15.375 \\
 &= \frac{15375}{1000} \\
 &= \frac{15375 \div 125}{1000 \div 125} \\
 &= \frac{123}{8}
 \end{aligned}$$

$$= \frac{123}{8}$$

# TERMINATING DECIMAL $\longrightarrow$ P/Q

-3.125

$$= -3.125$$

$$= -\frac{625}{1000}$$

$$\frac{1000}{200}$$

$$= -\frac{625}{200}$$

$$= -\frac{125}{40} = -\frac{25}{8}$$

② - ①

$$x = 7/9$$

$$0.\overline{7} = 7/9$$

$$x = 0.\overline{7}$$

$$x = 0.\overline{7} \dots$$

Multiply by 10 both sides.

$$\log x = 7.77777 \dots \quad +2$$

~~7.7777~~ ---  
~~0.7777~~ ---  
7

# PURE REPEATING DECIMAL $\longrightarrow$ P/Q



$$0.\overline{27} \text{ - pure.}$$

$$\text{Let, } x = 0.\overline{27}$$

$$x = 0.272727\ldots \quad \text{--- (1)}$$

$$100x = 27.272727\ldots \quad \text{--- (2)}$$

$$\text{(2) - (1)}$$

$$99x = 27$$

$$x = \frac{27}{99}$$

$$0.\overline{27} = \frac{27}{99}$$

$$27.\overline{272727}\ldots$$

$$0.\overline{272727}\ldots$$

$$\underline{27}$$

$$\frac{9}{33} = \frac{3}{11} \text{ Ans.}$$



# #CTR

$$\rightarrow 0.\overline{5} = 5/9$$

$$\rightarrow 0.\overline{9234} = \frac{9234}{9999}$$

$$\rightarrow 0.\overline{273} = \frac{273}{999}$$

$$\rightarrow 0.\overline{52} = 52/99$$

$$\rightarrow 0.\overline{8} = 8/9$$

$$1.\overline{3}$$

let,  $x = 1.\overline{3}$

$$x = 1.33333 \dots$$

$$10x = 13.3333 - \dots - 2$$

② - ①

$$9x = 12$$

$$\lambda = 12/9$$

$$1.\bar{3} = 4/3$$

let  $x = 1.\overline{3}$

$$x = 1 + 0.\overline{3}$$

$$x = 1 + \frac{3}{9}$$

$$x = \frac{9+3}{9}$$

$$x = 12/9$$

# PURE REPEATING DECIMAL $\rightarrow$ P/Q

$2.\overline{45}$

M.I

Let,  $x = 2.\overline{45}$

$$x = 2.454545 \dots \text{--- (1)}$$

$$100x = 245.454545 \dots \text{--- (2)}$$

$$\text{(2) - (1)}$$

$$99x = 243$$

$$x = 243/99$$

$$2.\overline{45} = \frac{27}{11}$$

M.II



Let,  $x = 2.\overline{45}$

$$x = 2 + 0.\overline{45}$$

$$x = \frac{2}{1} + \frac{45}{99}$$

$$x = \frac{198 + 45}{99}$$

$$x = 243/99 = \frac{27}{11}$$

# PURE REPEATING DECIMAL $\longrightarrow$ P/Q

$$\boxed{3.\overline{125}}$$

Sol,

$$x = 3.\overline{125}$$

$$x = 3 + 0.\overline{125}$$

$$x = 3 + \frac{125}{999}$$

$$x = \frac{2997 + 125}{999} = \boxed{\frac{3122}{999}}$$

# MIXED / GENERAL REPEATING DECIMAL $\rightarrow P/Q$



$0.1\overline{6}$  Mixed

M.I

$$x = 0.1\overline{6}$$

$$10x = 1.\overline{6}$$

$$10x = 1.6666\dots \text{---} \textcircled{1}$$

$$100x = 16.\overline{6} \text{---} \textcircled{2}$$

$$\textcircled{2} - \textcircled{1}$$

$$90x = 15$$

$$x = 15/90$$

$$0.1\overline{6} = \frac{1}{6}$$

M.II

$$\text{Let, } x = 0.1\overline{6}$$

$$10x = 1.\overline{6}$$

$$10x = 1 + 0.\overline{6}$$

$$10x = 1 + \frac{6}{10}$$

$$10x = \frac{16}{10}$$

$$x = 15/90 = \frac{1}{6}$$

# MIXED / GENERAL REPEATING DECIMAL $\longrightarrow$ P/Q

M.II



$$\boxed{2.35\overline{7}}$$

Let,  $x = 2.35\overline{7}$

$$100x = 235.\overline{7}$$

$$100x = 235.777\ldots \quad \text{--- (1)}$$

$$1000x = 2357.777\ldots \quad \text{--- (2)}$$

$$\text{(2) - (1)}$$

$$900x = 2122$$

$$x = \frac{2122}{900}$$

$$\boxed{\frac{1061}{450}}$$

$$x = 2.35\overline{7}$$

$$100x = 235.\overline{7}$$

$$100x = 235 + 0.\overline{7}$$

$$100x = 235 + \frac{7}{10}$$

Q  $1.23\overline{45}$  into  $\frac{p}{q}$  Form?

$$x = 1.23\overline{45}$$

$$100x = 123.\overline{45} \quad \text{--- (1)}$$

$$10000x = 12345.\overline{45} \quad \text{--- (2)}$$

$$9900x = 12222$$

$$x = \frac{12222}{9900}$$

Simplest Form

## QUESTION

Convert  $0.999999\ldots$  into  $\frac{p}{q}$

$$0.\overline{9} \rightarrow p/q$$

$$\frac{9}{9} = 1 //$$

# Thank You !

- *Work Hard.*
- *Dream big.*
- *Never give up.*