



UDAAN

RITIK



2026

REAL NUMBERS

MATHS

LECTURE-3

BY-RITIK SIR

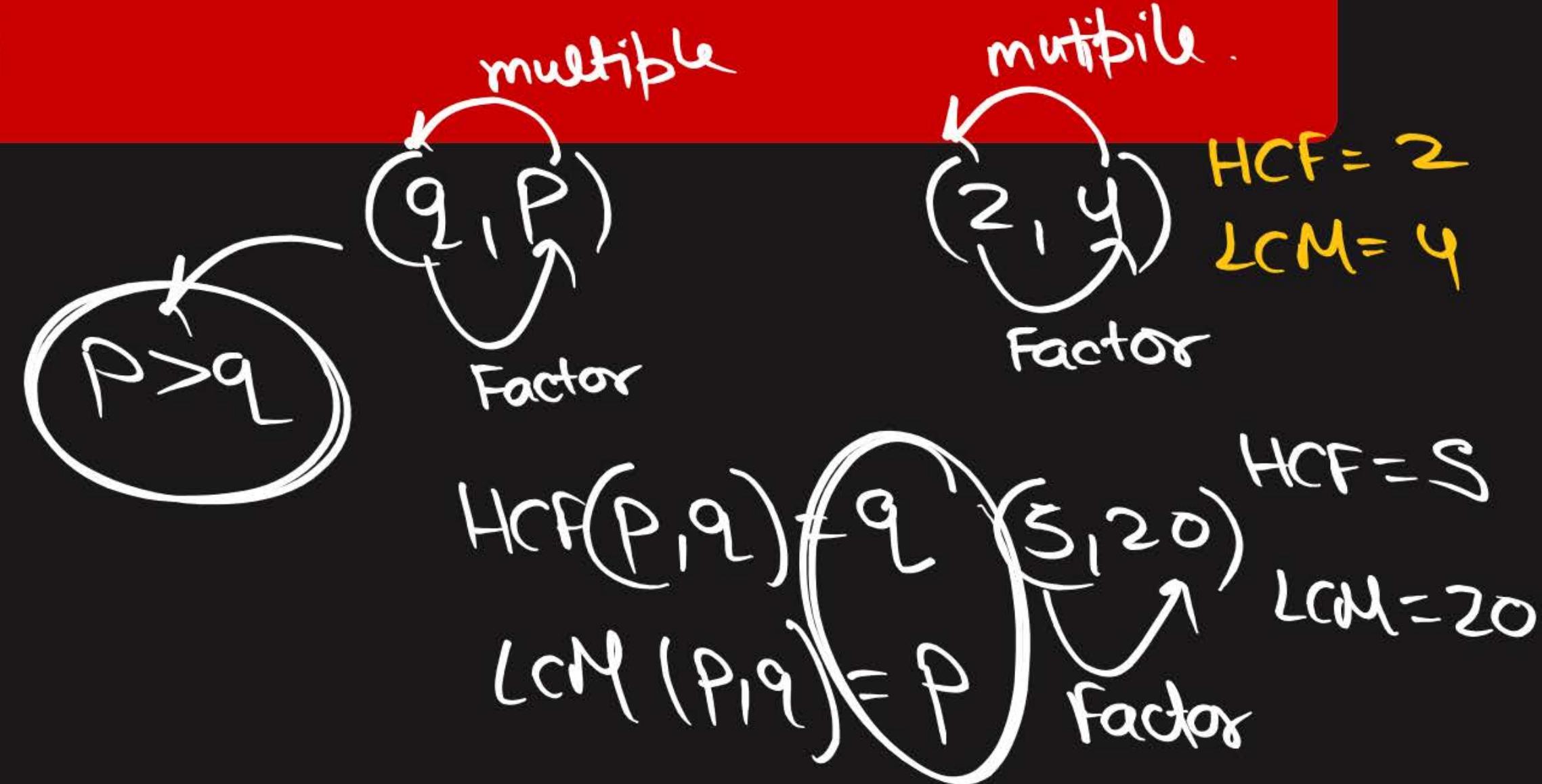


Topics *to be covered*

- A Coprime numbers (Relatively Prime)
 - B Relation between HCF and LCM of two numbers
 - C Word Problems on HCF and LCM
- next class.*

#Q. If 'p' and 'q' are natural numbers and 'p' is the multiple of 'q', then what is the HCF of 'p' and 'q'?

- A pq
- B p
- C q
- D $p + q$



Jab chota no, bade no ka factor hai,

toh HCF = chota no

LCM = bade no

multiple

Q. (25, 100)
Factor

HCF = 25
LCM = 100

(25, 100)

$25 \times 100 = 25 \times 100$



Relation b/w HCF and LCM for two positive integers

For any two positive integers a and b

$$\text{HCF}(a, b) \times \text{LCM}(a, b) = a \times b$$

$$\frac{(a, b)}{\text{HCF}(a, b) \times \text{LCM}(a, b)} = a \times b$$

$\{1, 2, 3, 4, 5, \dots\}$
 $\infty\}$

$\{-\infty, \dots, -5, -4, -3, -2, -1\}$

o \rightarrow naahi positive naahi negative.

#Q. Given that $\text{HCF}(306, 657) = 9$, find $\text{LCM}(306, 657)$

M.I

Prime factorisation

$\text{HCF} \times \text{LCM} = \text{Product of two no.s.}$

$$9 \times \text{LCM} = 306 \times 657$$

$$\text{LCM} = \frac{306 \times 657}{81}$$

$$= 22338$$

#Q. The LCM and HCF of two numbers are 180 and 6 respectively. If one of the numbers is the other number.

$$\text{Let } a, b$$

$$\text{LCM}(a, b) = 180$$

$$\text{HCF}(a, b) = 6$$

$$a = 30$$

$$b = ?$$

$$\text{HCF} \times \text{LCM} = a \times b$$

$$6 \times 180 = 30 \times b$$

$$\frac{6 \times 180}{30} = b$$

$$b = 36$$

$\theta =$

144, 90

$$\begin{array}{r} 2 \\ \hline 2 | 144 \\ 2 | 72 \\ 2 | 36 \\ 2 | 18 \\ 3 | 9 \\ 3 | 3 \\ 1 \end{array}$$

$$\begin{array}{r} 2 \\ \hline 2 | 90 \\ 3 | 45 \\ 3 | 9 \\ 3 | 3 \\ 1 \end{array}$$

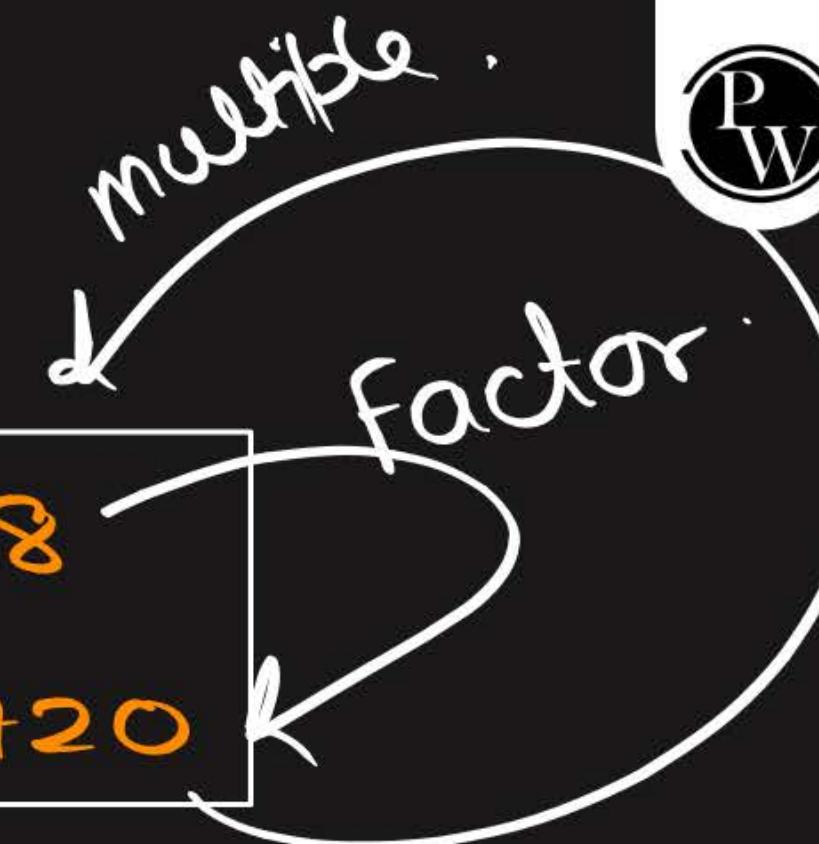
$$144 = 2^4 \times 3^2 \times 5^0$$

$$90 = 2^1 \times 3^2 \times 5^1$$

$$\text{HCF} = 2^1 \times 3^2 \times 5^0 =$$

$$\text{LCM} = 2^4 \times 3^2 \times 5^1 = 720$$

$$\boxed{18}$$



P
W

#Q. Can two numbers have 16 as their HCF and 380 as their LCM? Give reason.

HCF = 16] not a factor
LCM = 380]

∴ No

HCF is always a factor of LCM.

LCM is a multiple of HCF.

#Q. If the LCM of two numbers is 3600, then which of the following numbers
~~can HCF?~~

$$\text{LCM} = 3600$$

- A 600 ✓
- B 500 ✓ not a factor .
- C 400 ✓
- D 150 ✓

~~True~~

#Q. Assertion (A) : For two odd prime numbers x and y , ($x \neq y$), $\text{LCM}(2x, 4y) = 4xy$

~~True~~ Reason (R) : $\text{LCM}(x, y)$ is a multiple of $\text{HCF}(x, y)$.

CBSE 2025

A Both A and R are true and R is correct explanation of A.

B Both A and R are true and R is NOT the correct explanation of A.

C A is true, but R is false.

D A is false, but R is true.

1, 2, 3, 4, 5, 6, 7, 8, 9
 odd odd
 prime. prime.

$$2x = 2^1 \times x^1 \quad \text{two odd prime} \quad \text{HCF} = 1$$

$$4y = 2^2 \times y^1 \times x^0 \quad \text{LCM} = xy$$

$$\text{LCM} = 2^2 \times x^1 \times y^1 \quad \text{LCM} = 4xy$$



Prime and Co-prime Numbers

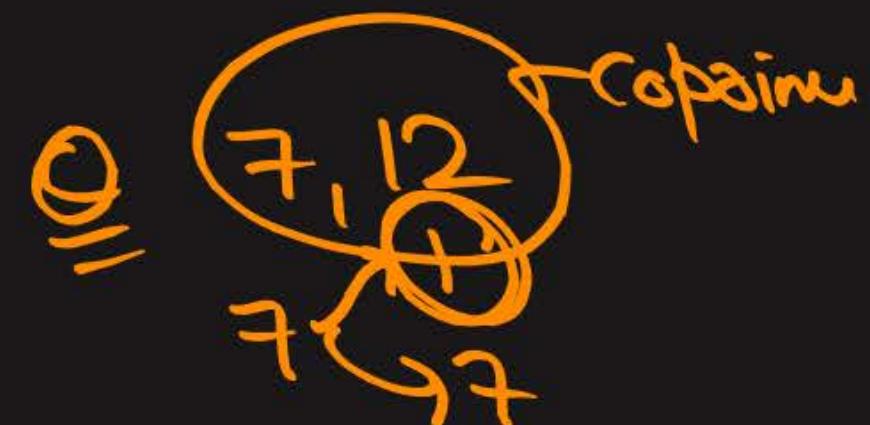
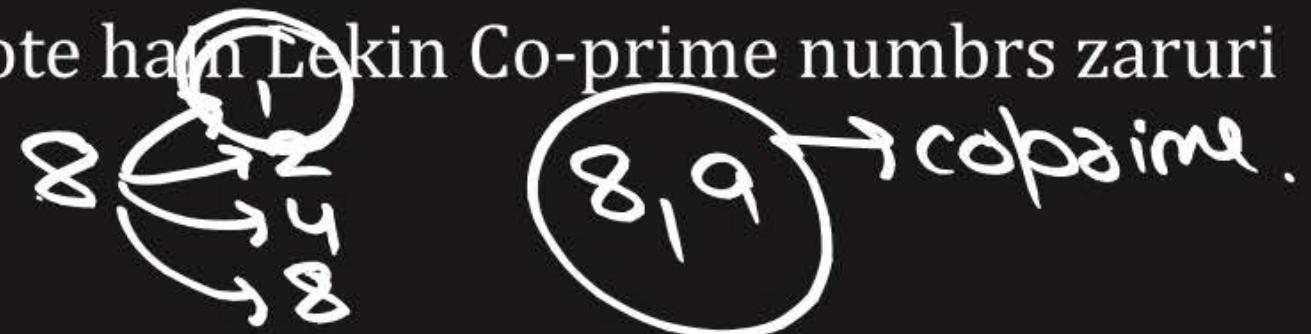
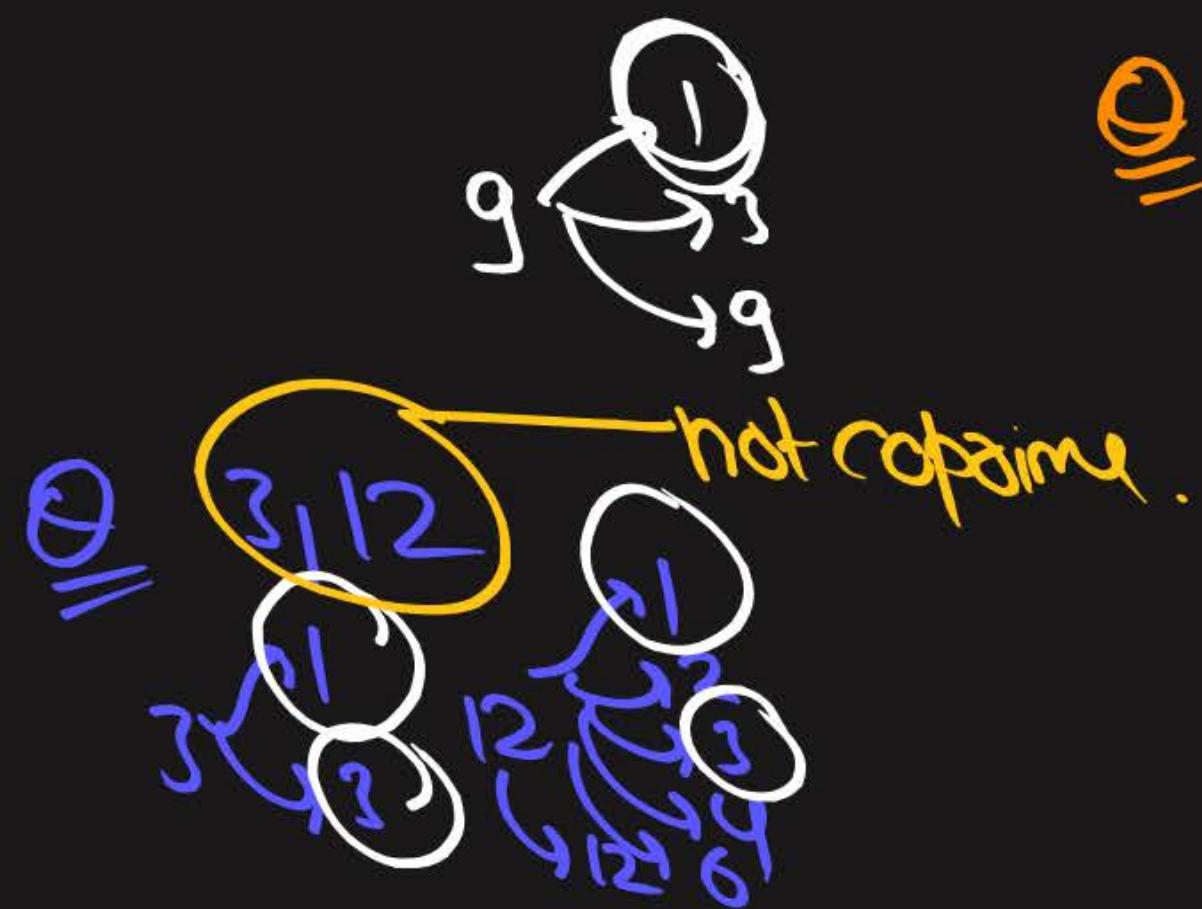
→ 2 nos. (Relatively prime)



Note : 2 Prime Numbers hamesha Co-prime hote hain Lekin Co-prime numbers zaruri
nahi haiki prime ho.



HCF of coprime = 1



→ coprime nos → 2 nos

#Q. If a and b are relatively prime numbers, then what is their HCF?



#Q. If a and b are relatively prime numbers, then what is their LCM?

coprimos \rightarrow 2 nos

ab

#Q. Two numbers are in the ratio 2 : 3 and their LCM is 180. what is the HCF of these numbers?

CBSE(2023)

Let the no's be $2x$ and $3x$

$$\text{LCM}(2x, 3x) = 180$$

$$\text{HCF}(2x, 3x) = ?$$

$$2x = 2^1 \times x^1 \times 3^0$$

$$3x = 3^1 \times x^1 \times 2^0$$

$$\text{HCF} = 2^0 \times 3^0 \times x^1 = \boxed{x}$$

$$\text{LCM} = 2^1 \times 3^1 \times x^1 = \boxed{6x}$$

$$\text{LCM} = 180$$

$$6x = 180$$

$$x = \frac{180}{6}$$

$$\boxed{x = 30}$$

$\therefore \text{HCF} = 30$

#Q. Explain why $7 \times 11 \times 13 + 13$ and $7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 + 5$ are composite numbers.

Let

$$x = \underline{\underline{7 \times 11 \times 13 + 13}}$$

$$x = 13 [7 \times 11 + 1]$$

x

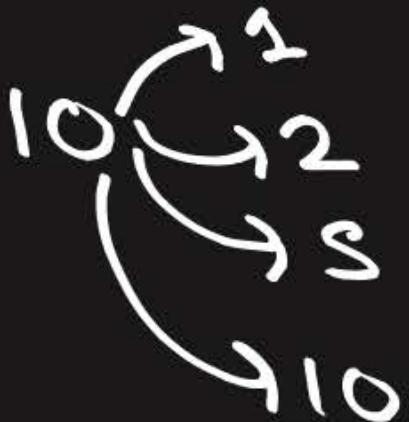
$$13 [78] \begin{array}{c} \xrightarrow{13} \\ \xrightarrow{78} \\ \xrightarrow{1} \\ \xrightarrow{13 \times 78} \end{array}$$

clearly 'x' has more than
2 factors, \therefore composite no.

$$S[7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 + 1]$$



Q. Since 10 is
a composite
no.



Since 10 has more
than 2 factors,
 \therefore 10 is a composite
no.

#GPM

#Q. Explain why $3 \times 5 \times 7 + 7$ is a composite number.

#Q. Let x and y two distinct prime numbers and $p = x^2y^3$, $q = xy^4$, $r = x^5y^2$. Find the HCF and LCM of p , q and r .

Further check if $\text{HCF}(p, q, r) \times \text{LCM}(p, q, r) = p \times q \times r$ or not.

#GPH

$$\text{HCF} = xy^2$$
$$\text{LCM} = x^5y^4$$

$$xy^2 \times x^5y^4 = x^3y^3 \times xy^4 \times x^5y^2$$

$$x^6y^6 \neq x^8y^9$$

#Q. If the least prime factors of two positive integers a and b are 5 and 13 respectively, then the least prime factor of $a + b$, is _____.

~~#GPK~~

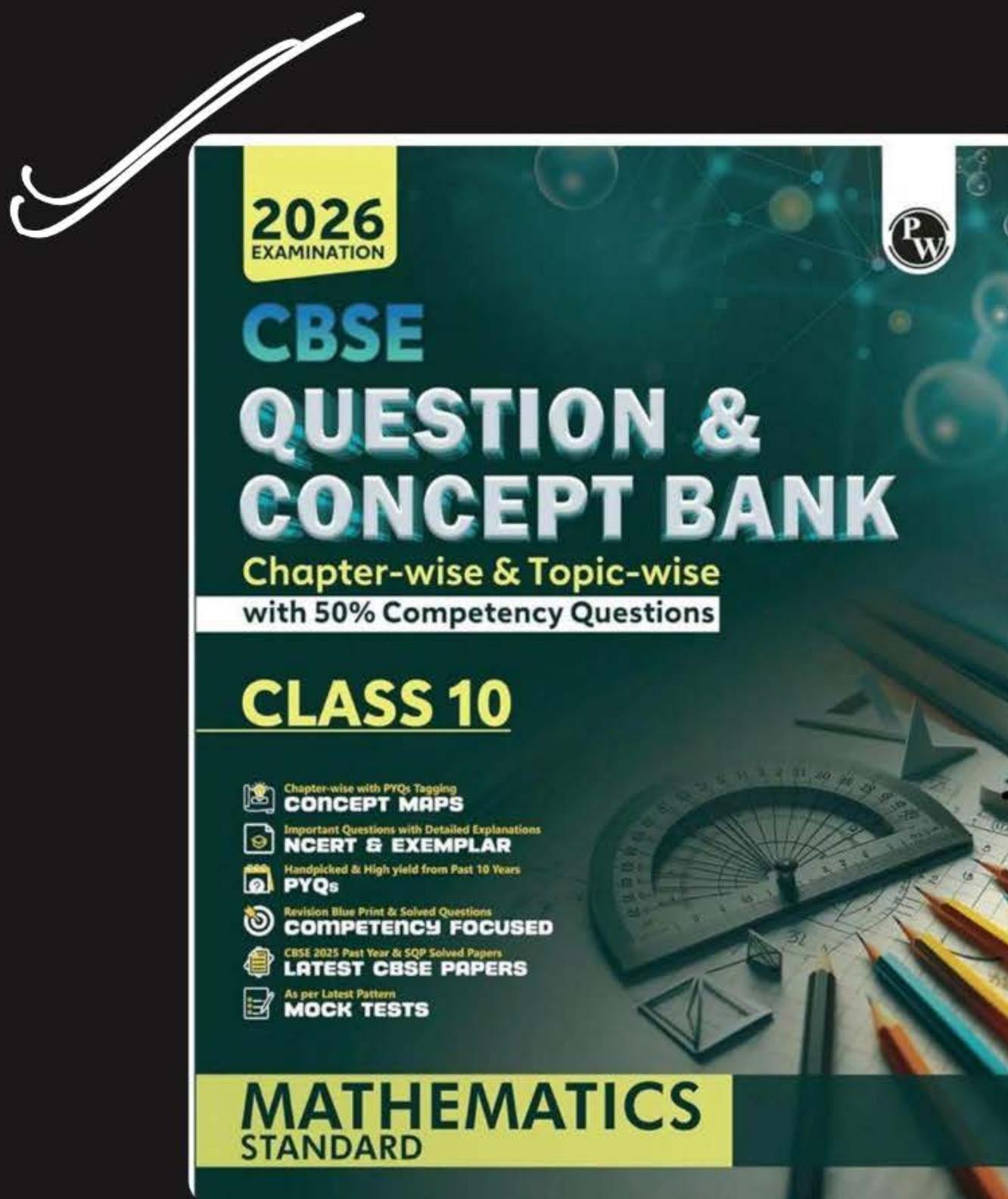
- A 2
- B 3
- C 5
- D 1

#Q. Teaching Mathematics through activities is a powerful approach that enhances student's understanding and engagement. Keeping this a mind Ms. Mukta planned a prime number game for class 5 students. She announces the number 2 in her class and asked the first student to multiply it by a prime number and then pass it to second student. Second student also multiplied it by a prime number and passed it to third student. In this way by multiplying to a prime number, the last student got 173250.

Now, Mukta asked some questions as given below to the students:

- (i) What is the least prime number used by students?
- (ii) (a) How many students are in the class?
OR
(b) What is the highest prime number used by students?
- (iii) Which prime number has been used maximum times?

Next week



CLASS 10 (2025-26)

MATHEMATICS MADE EASY

- FORMULAS
- THEOREMS
- SOLVED CBSE QUESTION PAPERS
- SOLVED EXAMPLES
- PRACTICE QUESTIONS

Handwritten Notes

Other Books Made Easy
Samajh rahe ho?!

Ritik Mishra



**WORK HARD
DREAM BIG
NEVER GIVE UP**



Thank
You