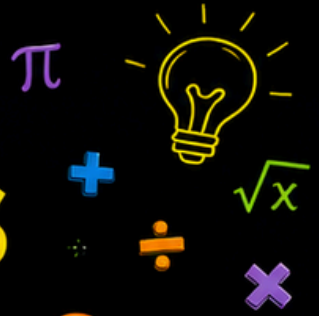




★ CLASS 10 MATHEMATICS ★ CHAPTER 1 REAL NUMBERS



MIND MAP

2

RATIONAL NUMBERS

A number that can be written in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

Examples

$$\frac{3}{5}, \frac{-7}{4}, 0, \frac{9}{11}$$

3

IRRATIONAL NUMBERS

A number that cannot be written in the form $\frac{p}{q}$, $q \neq 0$.

Examples

- $\sqrt{2}$
- $\sqrt{3}$
- $\sqrt{5}$
- π (pi)
- and many more...

6

LCM

(LEAST COMMON MULTIPLE)

Product of all prime factors (greatest powers).

Example

$$\begin{aligned} 12 &= 2^2 \times 3 \\ 18 &= 2 \times 3^2 \\ \text{LCM} &= 2^2 \times 3^2 = 36 \end{aligned}$$

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IMPORTANT PROOFS



- $\sqrt{2}$ is Irrational
 - $\sqrt{3}$ is Irrational
- (Method of Contradiction)

1

REAL NUMBERS

The set of all real numbers includes both rational and irrational numbers.

$$\begin{aligned} \text{Real Numbers} &= \\ &\text{Rational Numbers} \\ &+ \\ &\text{Irrational Numbers} \end{aligned}$$

4

FUNDAMENTAL THEOREM OF ARITHMETIC

Every composite number can be expressed as a product of prime numbers in a unique way, except for the order.

Example

$$60 = 2^2 \times 3 \times 5$$

5

HCF

(HIGHEST COMMON FACTOR)

Product of common prime factors (smallest powers).

Example

$$\begin{aligned} 12 &= 2^2 \times 3 \\ 18 &= 2 \times 3^2 \\ \text{HCF} &= 2 \times 3 = 6 \end{aligned}$$

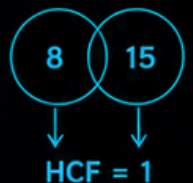
8

COPRIME NUMBERS

Two numbers are called coprime if their HCF = 1.

Examples

- (8, 15)
- (9, 10)
- (14, 25)



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RELATION BETWEEN HCF & LCM

$$\text{HCF} \times \text{LCM} = \text{Product of the Two Numbers}$$

or

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

KEY POINTS TO REMEMBER

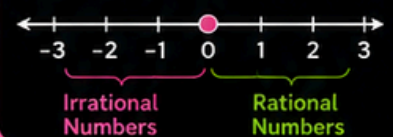
- ★ Learn Prime Factorisation Method.
- ★ $\text{HCF} \times \text{LCM} = \text{Product of Two Numbers}$.
- ★ Rational numbers can be written as $\frac{p}{q}$ ($q \neq 0$).
- ★ Irrational numbers cannot be written as $\frac{p}{q}$.
- ★ Real Numbers = Rational + Irrational.



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NUMBER LINE

All real numbers can be represented on the number line.



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