

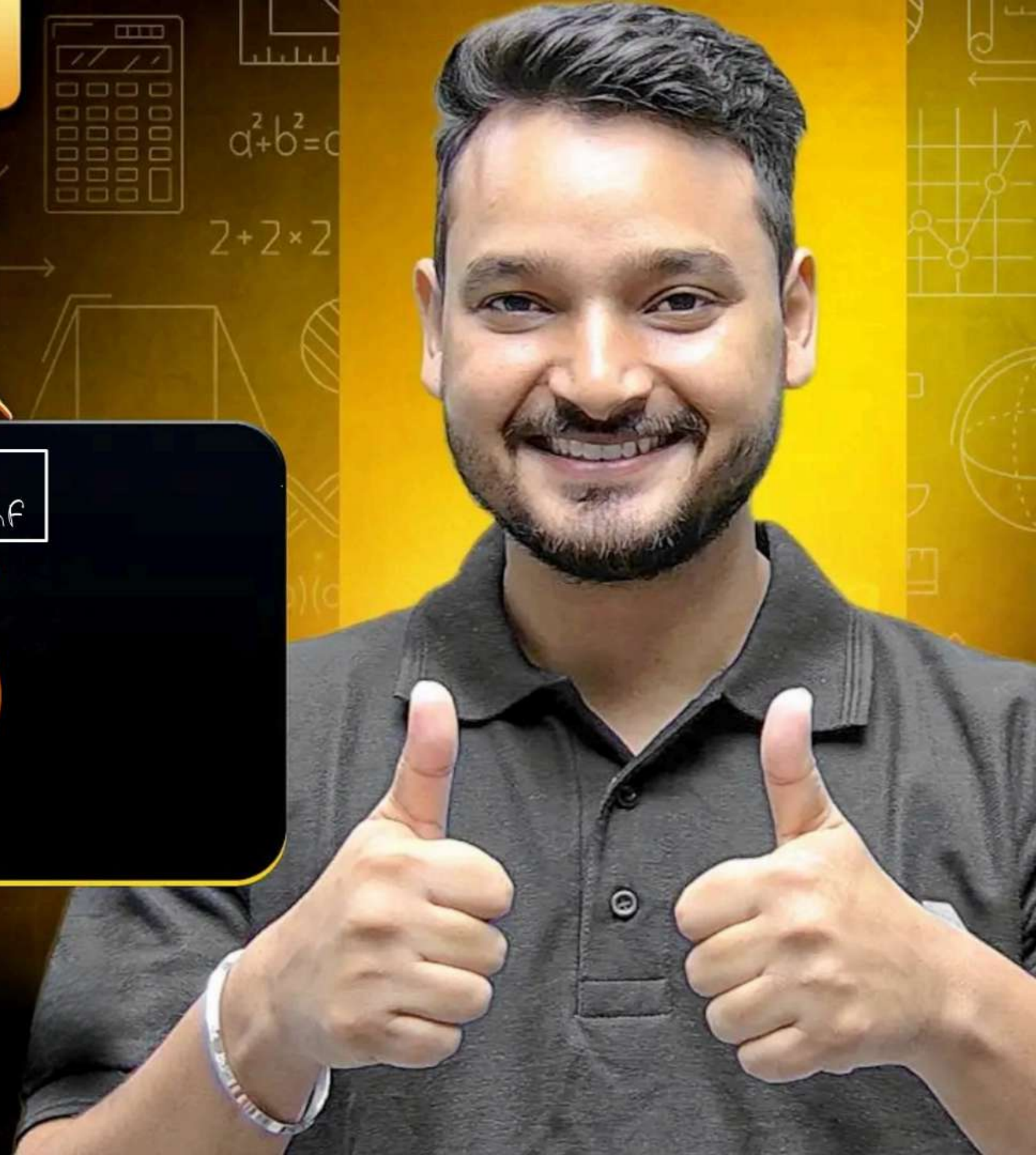
Class 11th Maths

प्रारंभ
BATCH

Always Believe In Yourself

SETS

Lecture 3





CONCEPT

Interval कौन है $\leftarrow [\quad] \rightarrow$ Interval नहीं करना

INTERVALS OF SETS

SET-BUILDER

$$A = \{x : x \in \mathbb{R} \text{ and } 2 \leq x \leq 5\}$$

$$B = \{x : x \in \mathbb{R} \text{ and } 2 \leq x < 5\}$$

$$C = \{x : x \in \mathbb{R} \text{ and } 2 < x < 5\}$$

$$D = \{x : x \in \mathbb{R} \text{ and } 2 < x \leq 5\}$$

GKB

$$\hookrightarrow \text{length of Interval} = b - a$$

$[a, b]$ (a, b)
 $[a, b)$ $(a, b]$

$$\text{length} = 5 - 2 = 3$$



$[2, 5] \rightarrow$ Closed Int.



$[2, 5) \rightarrow$ Semi Closed
Semi open



$(2, 5) \rightarrow$ open Int.



$(2, 5]$



CONCEPT

$$A = \{1, 2, 3\}$$

Power Subset

$\emptyset = \{ \}$ $\rightarrow$ '0' Element

$\{1\}$
 $\{2\}$
 $\{3\}$ $\rightarrow$ '1' Element

$\{1, 2\}$
 $\{1, 3\}$
 $\{2, 3\}$ $\rightarrow$ '2' Element

$\{1, 2, 3\} \rightarrow$ '3' Element

$$B = \{1, 2, 3, 4, 5\}$$

$$2^5 = 32$$

SUBSET OF A SET

Agar B ke saare Elements Set A ke Andar hain $\Rightarrow B$, A ka Subset hoga

B is a Subset of A

$$B \subset A$$

GKB

$$1 \in A$$

$$2 \in A$$

$$1, 2 \in A$$

$$\{1, 2\} \in A$$

$$\{1, 2\} \subset A$$

$\rightarrow \emptyset$ is a Subset of Every Set

$\rightarrow$ Koi Set Apna Subset bhi nahi hai

$\rightarrow$ Total no. of Subset = $2^n \rightarrow$ no. of Element

Set ke Andar Set

$$A = \{1, 2, \{3\}\}$$

$$1 \in A$$

$$2 \in A$$

$$\{3\} \in A$$

$$\{3\} \notin A$$

$$\{\{3\}\} \subset A$$



CONCEPT

UNIVERSAL SET $\rightarrow U$

Kisi Context में सबसे bada set

$$N = \{1, 2, 3, \dots\}$$

$$W = \{0, 1, 2, 3, \dots\}$$

$$R = U$$

Univ
Set
(U)

$$A = \{1, 2, 3, \dots, 10\}$$

$$B = \{1, 2, 3\}$$

$$C = \{2, 4, 6, 8, 10\}$$

$$D = \{5, 6, 7, 9\}$$

VENN DIAGRAM

Sets ko Diagram ki form
mei dikhate hai

Universal $\rightarrow$ Rectangle

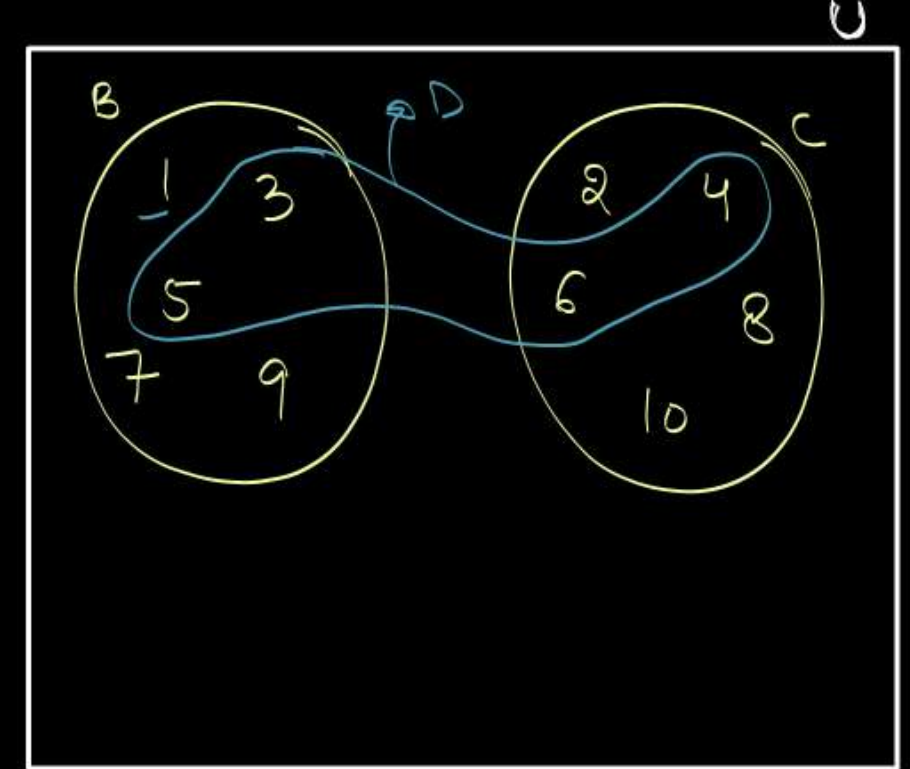
Baki Set $\rightarrow$ Circle/Ellipse

$$A = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$$

$$B = \{1, 3, 5, 7, 9\}$$

$$C = \{2, 4, 6, 8, 10\}$$

$$D = \{3, 4, 5, 6\}$$





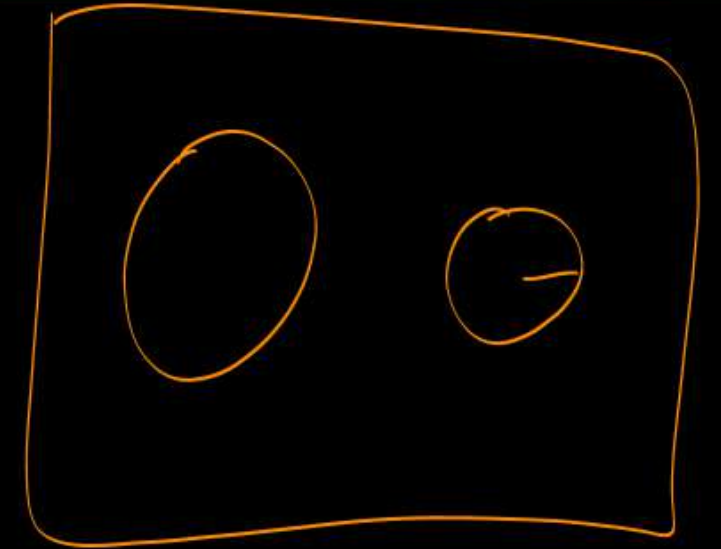
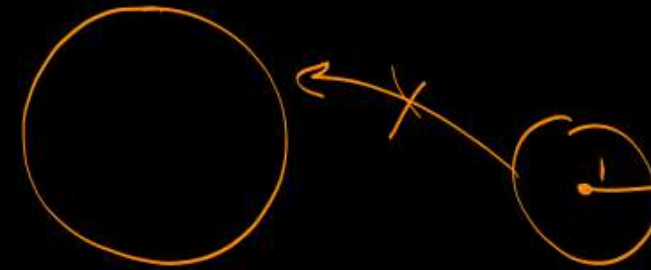
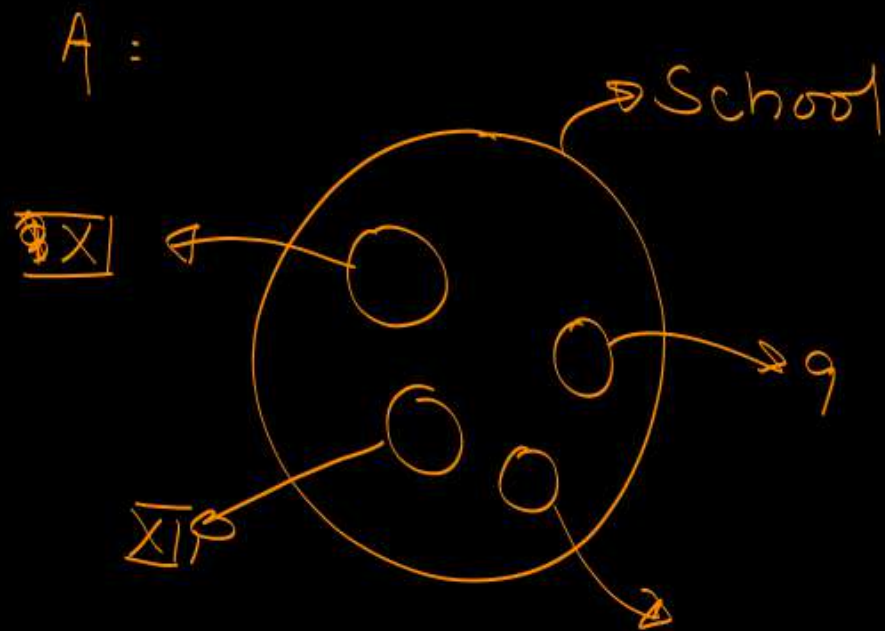
Make correct statements by filling in the symbols $\subset$ or $\not\subset$ in the blank spaces:

(i) $\{2, 3, 4\} \subset \{1, 2, 3, 4, 5\}$

(ii) $\{a, b, c\} \not\subset \{b, c, d\}$

(iii) $\{x : x \text{ is a student of Class XI of your school}\} \subset \{x : x \text{ student of your school}\}$

(iv) $\{x : x \text{ is a circle in the plane}\} \not\subset \{x : x \text{ is a circle in the same plane with radius 1 unit}\}$





Make correct statements by filling in the symbols $\subset$ or $\not\subset$ in the blank spaces:

(v) $\{x : x \text{ is a triangle in a plane}\} \not\subset \{x : x \text{ is a rectangle in the plane}\}$

(vi) $\{x : x \text{ is an equilateral triangle in a plane}\} \subset \{x : x \text{ is a triangle in the same plane}\}$

(vii) $\{x : x \text{ is an even natural number}\} \subset \{x : x \text{ is an integer}\}$



Let $A = \{1, 2, \{3, 4\}, 5\}$. Which of the following statements are incorrect and why?

(i) $\{3, 4\} \subset A \rightarrow \text{NO}$

(ii) $\{3, 4\} \in A \rightarrow \text{Yes}$

(iii) $\{\{3, 4\}\} \subset A \rightarrow \text{Yes}$

(iv) $1 \in A \rightarrow \text{Yes}$

(v) $1 \subset A \rightarrow \text{NO}$

(vi) $\{1, 2, 5\} \subset A \rightarrow \text{Yes}$

$A = \{1, 2, \{3, 4\}, 5\}$

$1 \in A$

$2 \in A$

$\{3, 4\} \in A$

$5 \in A$

$3 \notin A$

$4 \notin A$

$3, 4 \notin A$

$\{1\} \subset A$

$\{2\} \subset A$

$\{\{3, 4\}\} \subset A$

$$\{1, 2, 5\} \subset A, 1, 2, 5 \in A \quad \phi \notin A \quad \phi \subset A$$



Let $A = \{1, 2, \{3, 4\}, 5\}$. Which of the following statements are incorrect and why?

(vii) $\{1, 2, 5\} \in A \rightarrow \text{NO}$

(viii) $\{1, 2, 3\} \subset A \rightarrow \text{NO}$

(ix) $\phi \in A \rightarrow \text{NO}$

(x) $\phi \subset A \rightarrow \text{Yes}$

(xi) $\{\phi\} \subset A \rightarrow \text{NO}$

$$\phi \subset A$$

$$\{ \phi \} \not\subset A$$

$$1 \in A$$

$$2 \in A$$

$$5 \in A$$

$$1, 2, 5 \in A$$

$$\{1, 2, 5\} \in A$$

$$\{1, 2, 5\} \subset A$$



Write down all the subsets of the following sets

(i) $\{a\} \rightarrow \{a\}, \phi$

(ii) $\{a, b\} \rightarrow \phi, \{a\}, \{b\}, \{a, b\}$

(iii) $\{1, 2, 3\} \rightarrow \phi, \{1\}, \{2\}, \{3\}, \{1, 2\}, \{1, 3\}, \{2, 3\}, \{1, 2, 3\}$

(iv) $\phi \rightarrow \phi$



Write the following as intervals:

(i) $\{x : x \in \mathbb{R}, -4 < x \leq 6\} \longrightarrow (-4, 6]$

(ii) $\{x : x \in \mathbb{R}, -12 < x < -10\} \longrightarrow (-12, -10)$

(iii) $\{x : x \in \mathbb{R}, 0 \leq x < 7\} \longrightarrow [0, 7)$

(iv) $\{x : x \in \mathbb{R}, 3 \leq x \leq 4\} \longrightarrow [3, 4]$

[]

()



Write the following intervals in set-builder form:

(i) $(-3, 0)$

(ii) $[6, 12]$

(iii) $(6, 12]$

(iv) $[-23, 5)$

$$A = \{x : x \in \mathbb{R} \text{ and } -3 < x < 0\}$$

$$B = \{x : x \in \mathbb{R} \text{ and } 6 \leq x \leq 12\}$$

THANK YOU

Stay Connected
KEEP LEARNING



@NEXTTOPPERS_SCIENCE



@NextToppersScience