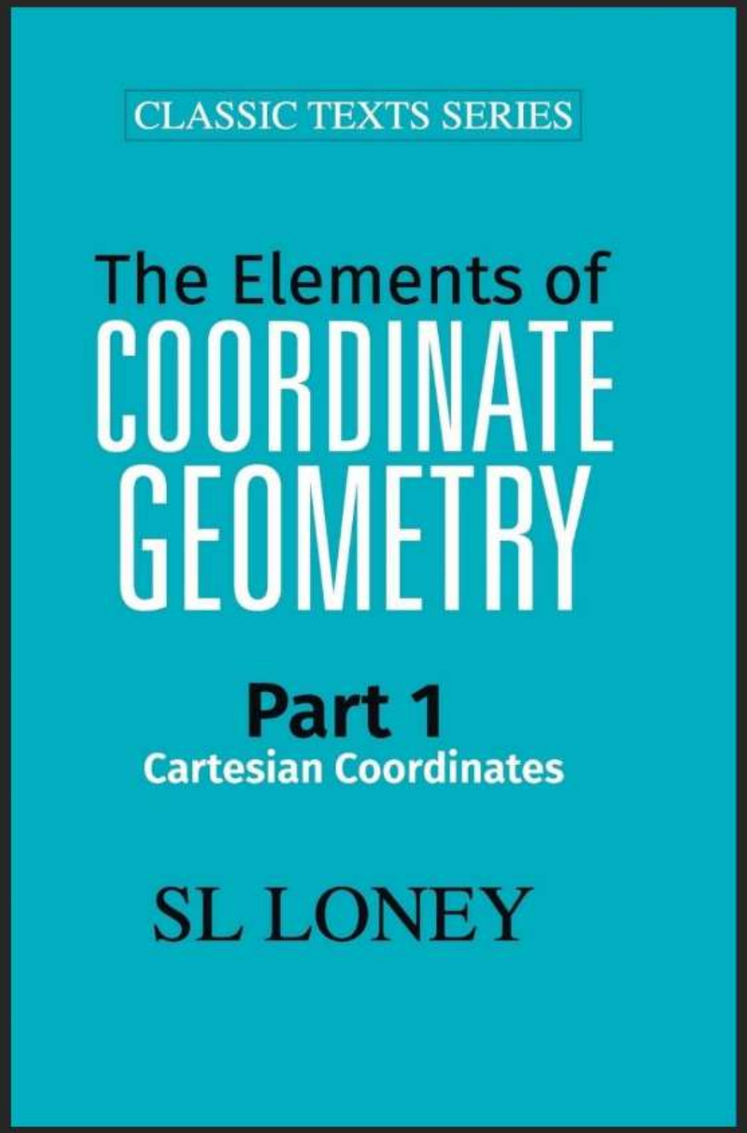
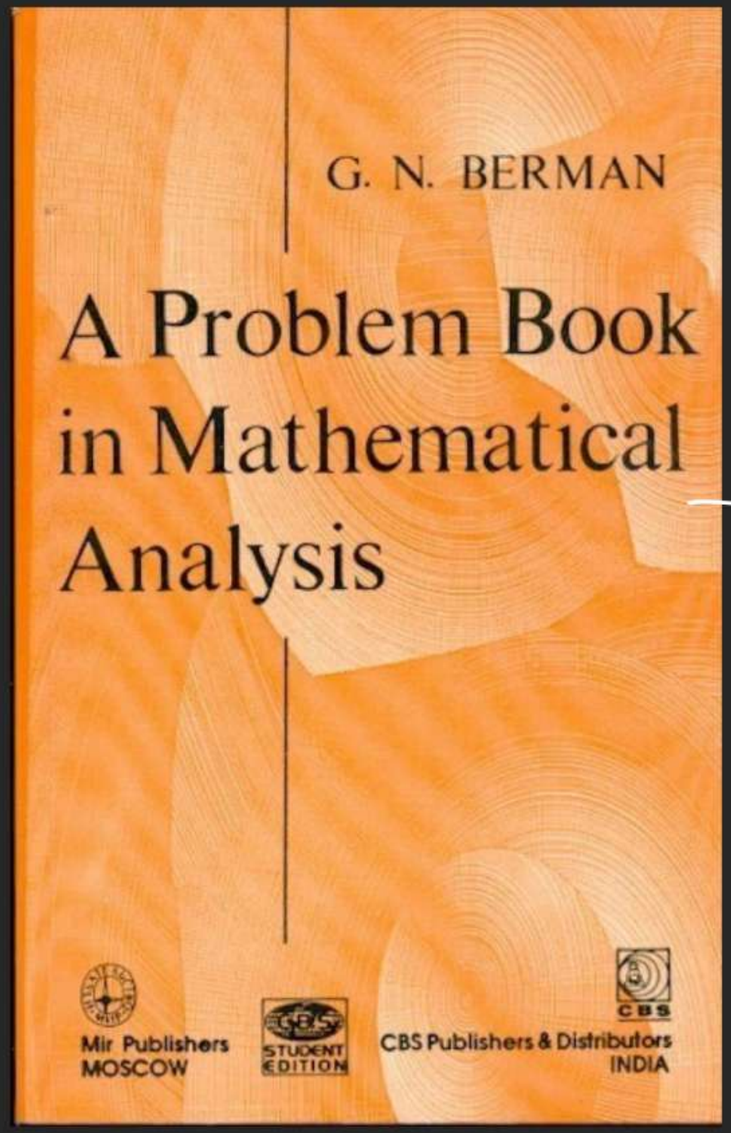
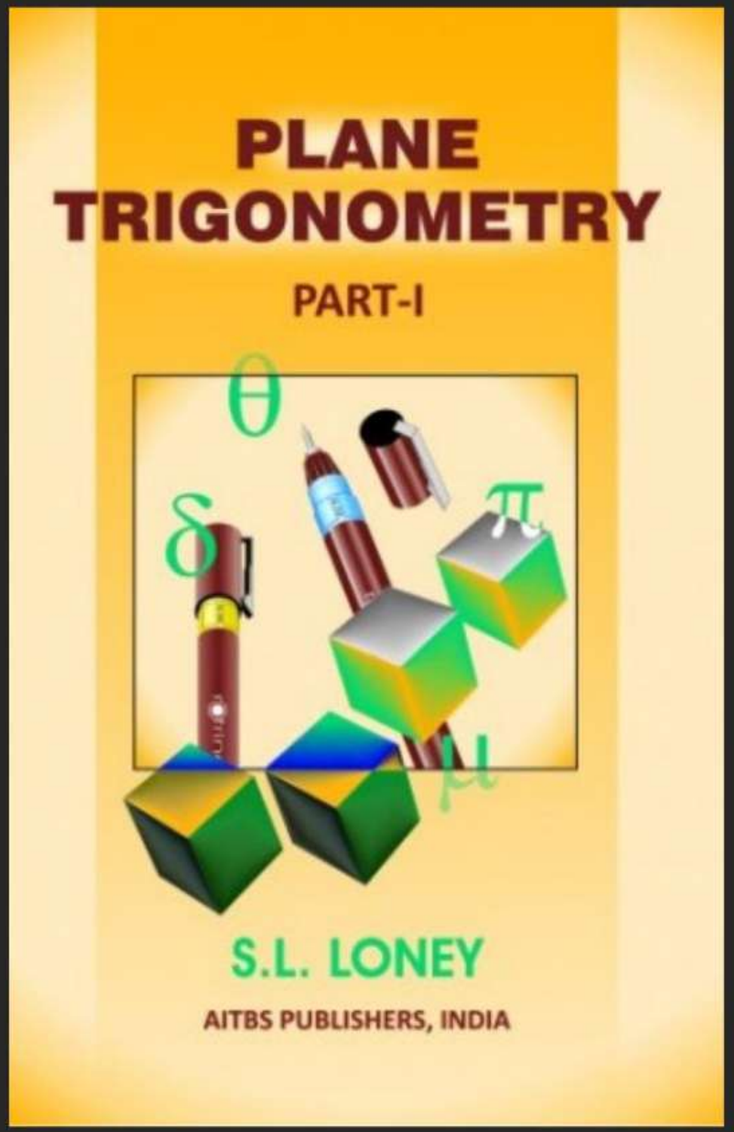
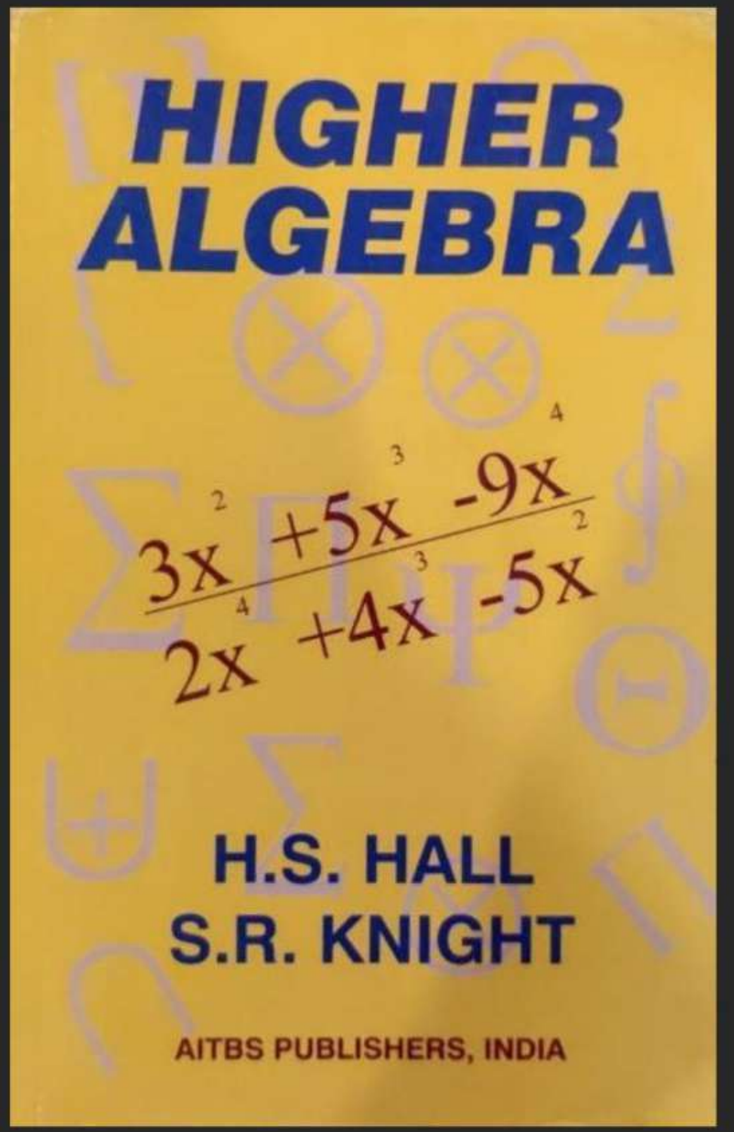
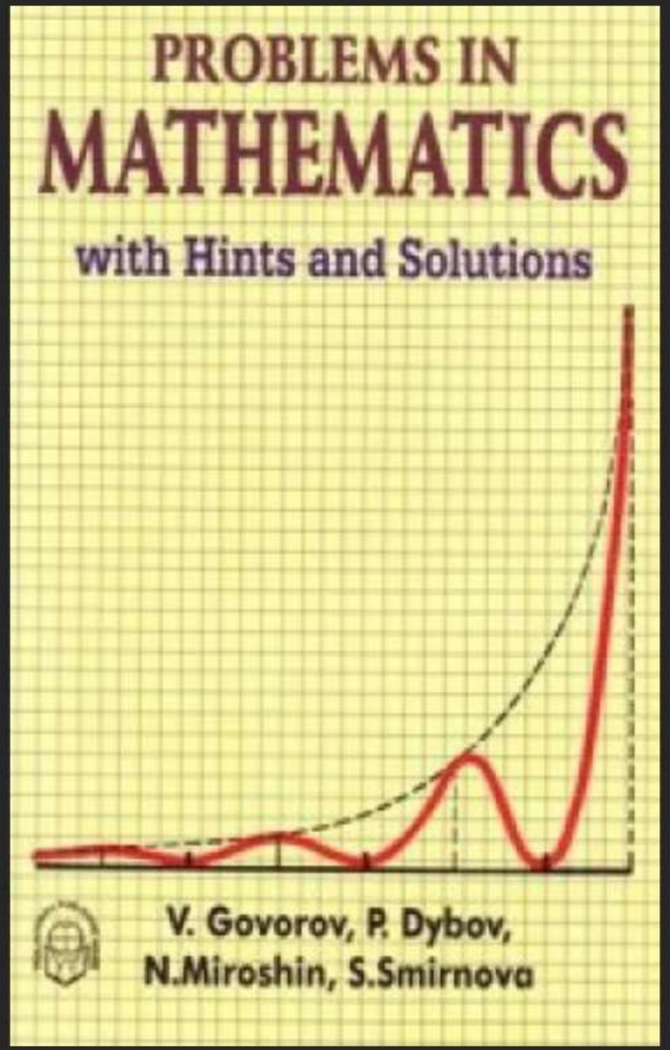




→ XII class







Nishant Jindal

Sets

well defined collection of objects

$\{1, 2, 3, 4, \ldots\}$ ← Roster form

$\{x : x \in N\}$ ← Set builder form

$\{x \mid x \in N\}$

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$\{x \mid x^2 = 4\}$

$\{-2, 2\}$

$\sqrt{4} = 2$

$\sqrt{x}$ is non negative

$\sqrt{-4}$ is non real

$x \geq 0$

Subset:

$$A \subset B$$

A is subset of B

B is superset of A

$a \in A$, then $a \in B$

* $A = \{1, 2, 3\}$, $B = \{1, 2, 3, 5, 7\}$

$B \not\subset A$

$\Rightarrow A \subset B$

Empty Set

having no element.

$$\{\phi\}$$

$$\{x \mid x \in R \text{ and } x^2 = -9\}$$

$$= \{\phi\}$$

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

How many subsets of A are possible.

$= 8$

$\{\phi\}, \{1\}, \{2\}, \{3\}, \{1, 2\}, \{1, 3\}, \{2, 3\}, \{1, 2, 3\}$

Union of sets

Union of A & B = A ∪ B A or B

↓

set of elements which belong to A or B

$A = \{1, 3, 5\}$, $B = \{1, 2, 3\} \Rightarrow A \cup B = \{1, 2, 3, 5\}$

Intersection of sets

Intersection of A & B

$A \cap B$ = set of all elements which are common to A & B

and

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

$A \cap B = \{1, 3\}$

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Inequalities

$x = ?$

① $x - 5 > 0$

$\Rightarrow x > 5 \quad \Rightarrow x \in (5, \infty)$

② $2x + 3 < 0 \Rightarrow \boxed{x < -\frac{3}{2}}$

$2\left(x + \frac{3}{2}\right) < 0$

$\Rightarrow x + \frac{3}{2} < 0 \Rightarrow x - \left(-\frac{3}{2}\right) < 0$

$\Rightarrow x < -\frac{3}{2} \Rightarrow \boxed{x \in \left(-\infty, -\frac{3}{2}\right)}$

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$a > b \Rightarrow a - b > 0$

$2(a-b) > 0$

$2a > 2b$

$a > b \quad a > b \Rightarrow a + c > b + c$

$c < 0 \Rightarrow$

$a > b \Rightarrow$

$ca > cb$ if $c > 0$

$ca < cb$ if $c < 0$

$0 \rightarrow$ not defined

$a > b$

$\Rightarrow a - b > 0$

$c < 0$

$c(a-b) < 0$

$ca < cb$

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$(x-2)(x-3) > 0 \Rightarrow$

$x = 1.9$ $\quad (1.9-2)(1.9-3) > 0$

$x < 2$ or $x > 3$

$x = 3.5$ $\quad (3.5-2)(3.5-3) = 1.5 \times 0.5 > 0$

$x \in (-\infty, 2)$

OR

$x \in (3, \infty)$

$(x-2)(x-3) \geq 0$ $\quad x-2 \geq 0$ $\quad x \geq 2$

$x \in (-\infty, 2) \cup (3, \infty)$

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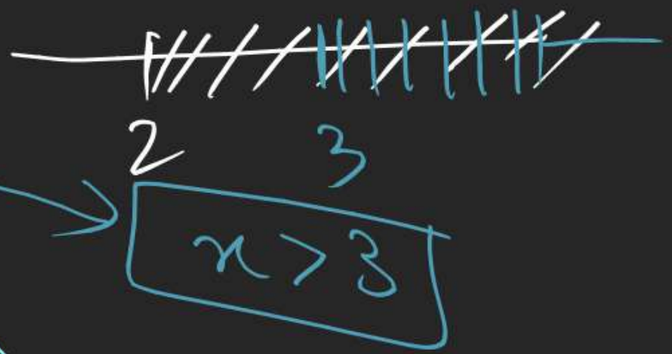
$(x-2)(x-3) > 0$

$x \in (-\infty, 2) \cup (3, \infty)$

$x-2 > 0$ & $x-3 > 0$

$x > 2$ & $x > 3$

or

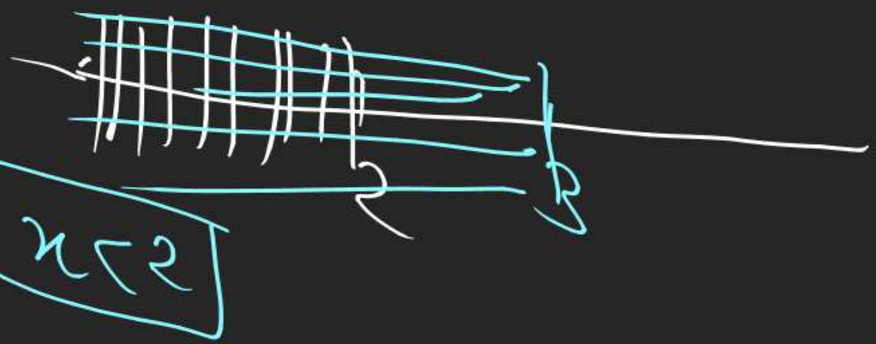


$x < 2$ $\Leftarrow$ $x-2 < 0$ & $x-3 < 0$

$x < 2$ & $x < 3$

$x < 2$

$x < 2$



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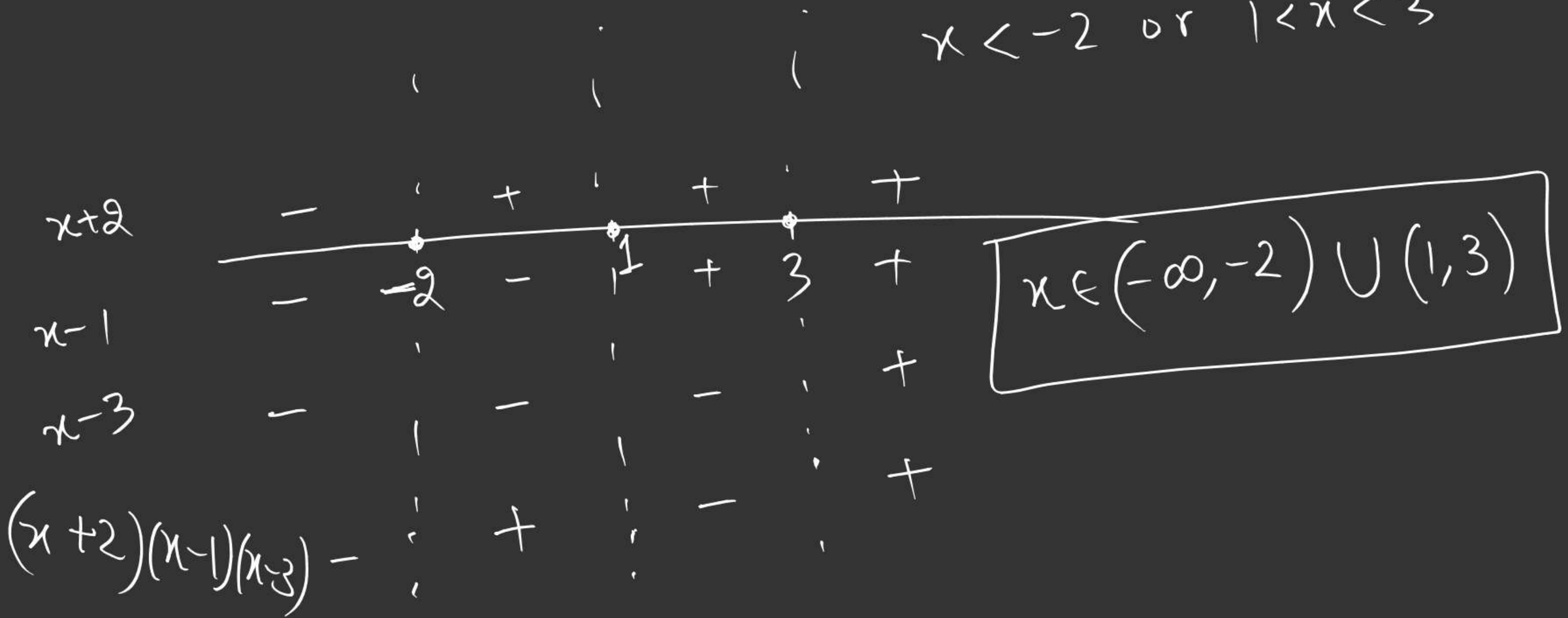
$(x+2)(x-3)(x-1) < 0$ $\quad x = ?$



Nishant Jindal

$$(x+2)(x-1)(x-3) < 0$$

$x \in (-\infty, -2) \cup (1, 3)$

$(x+2)(x-1)(x-3)$

$$(x+7)(2x-1)(3x+5)(x-2) \leq 0$$

$x = 7$

$$x \in \left[-7, -\frac{5}{3}\right] \cup \left[\frac{1}{2}, 2\right] \Rightarrow \text{Ans}$$