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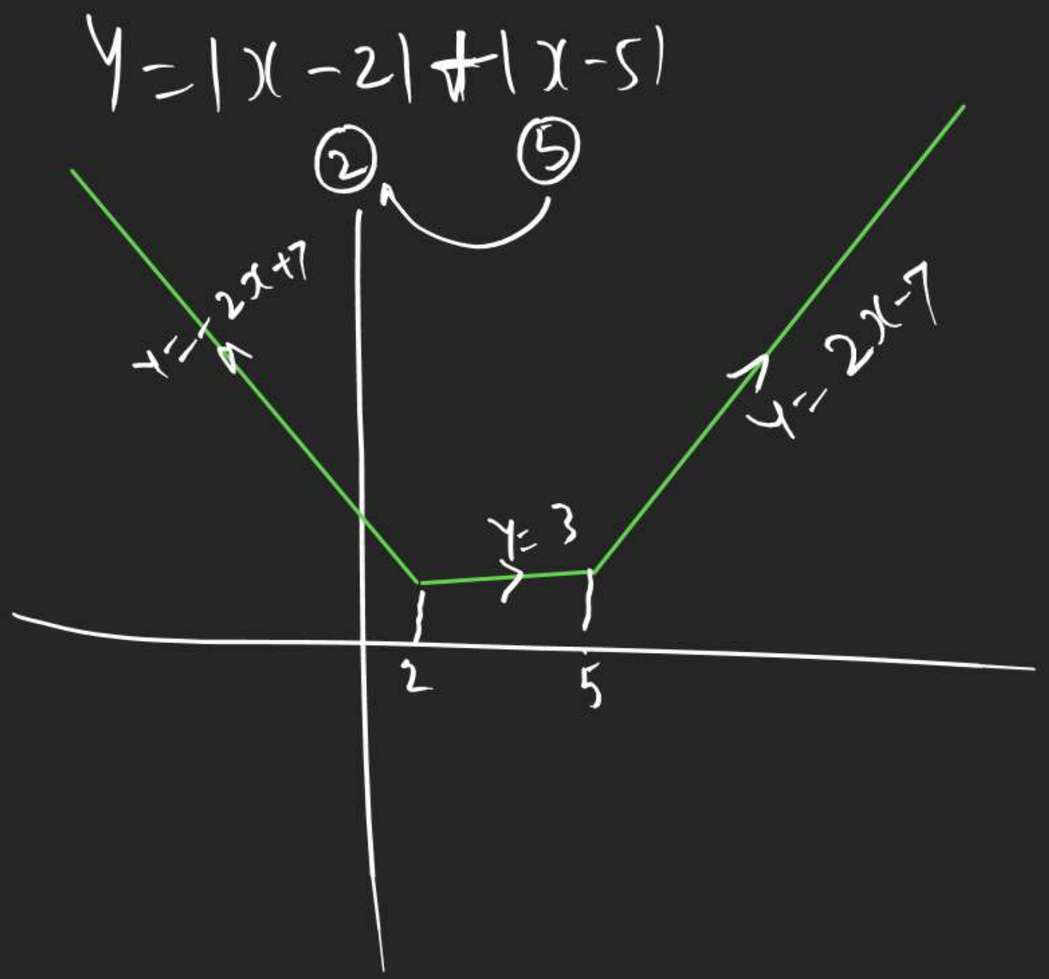
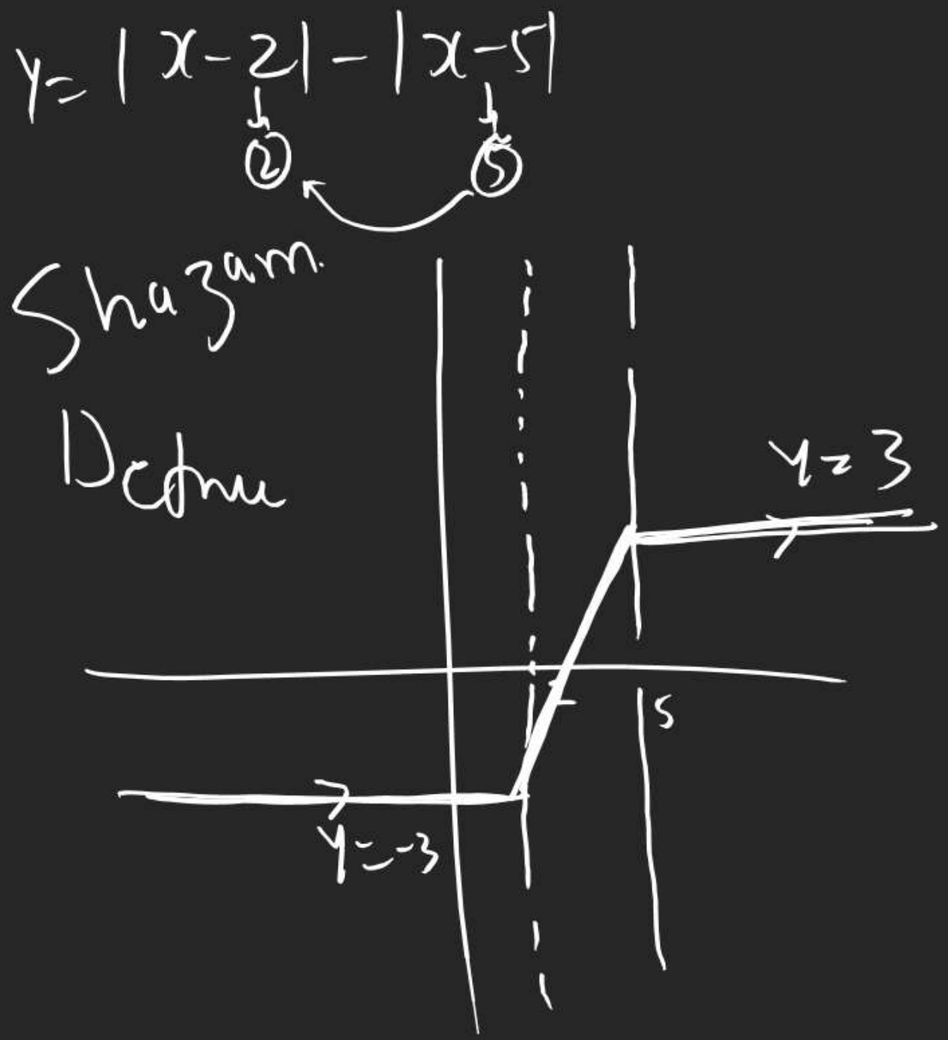
RELATION FUNCTION





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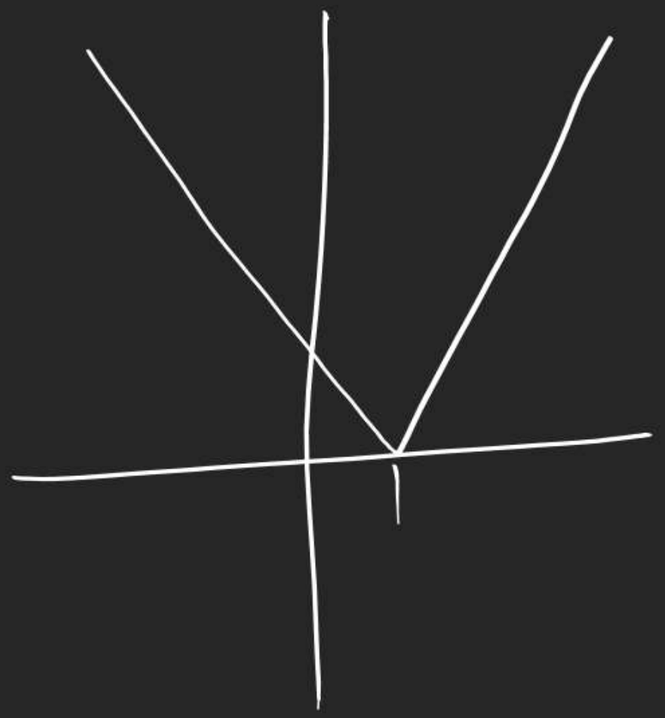
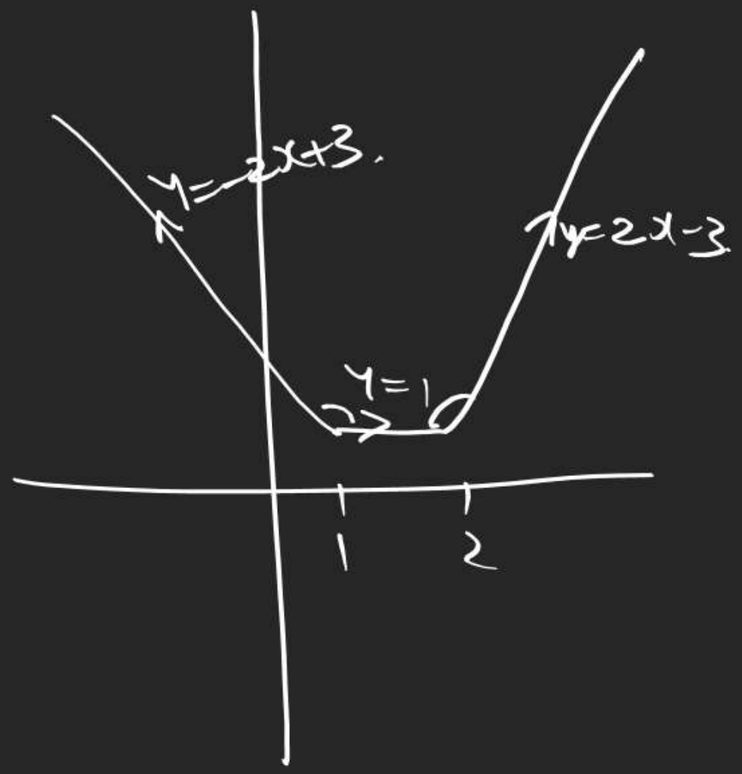
RELATION FUNCTION

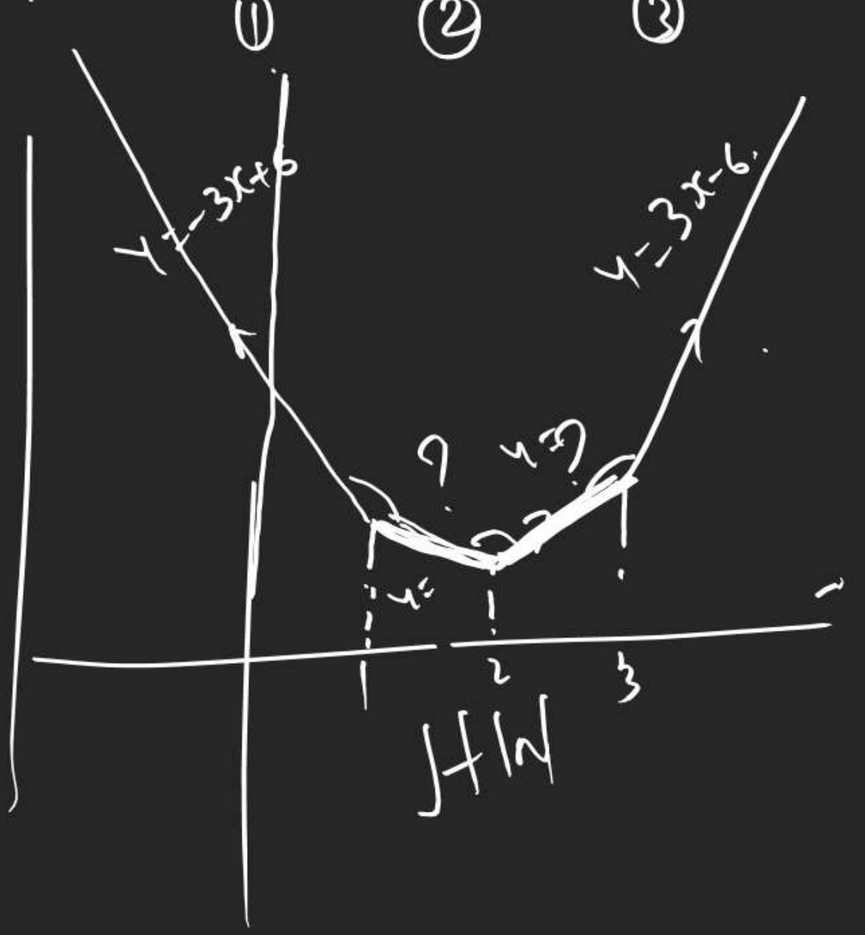
$y=|x-1|$



$y=|x-1|+|x-2|$



$y=|x-1|+|x-2|+|x-3|$



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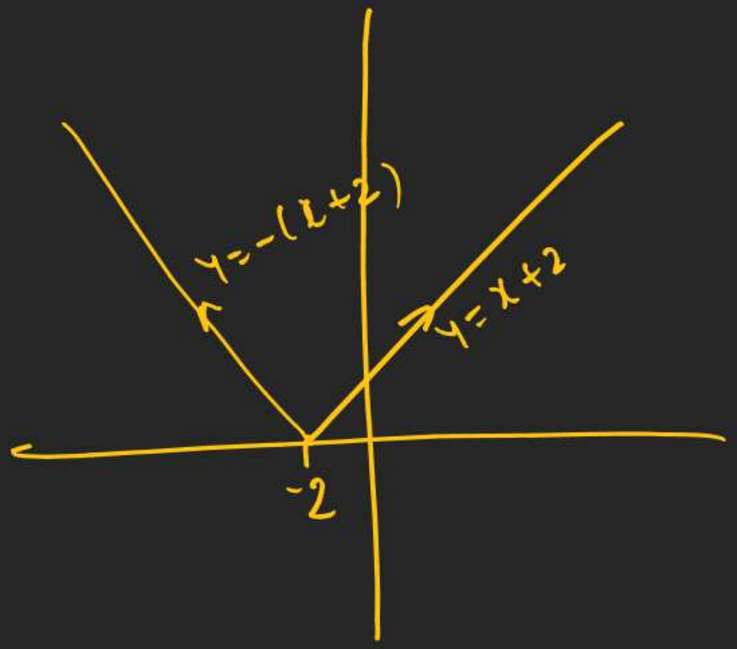
RELATION FUNCTION

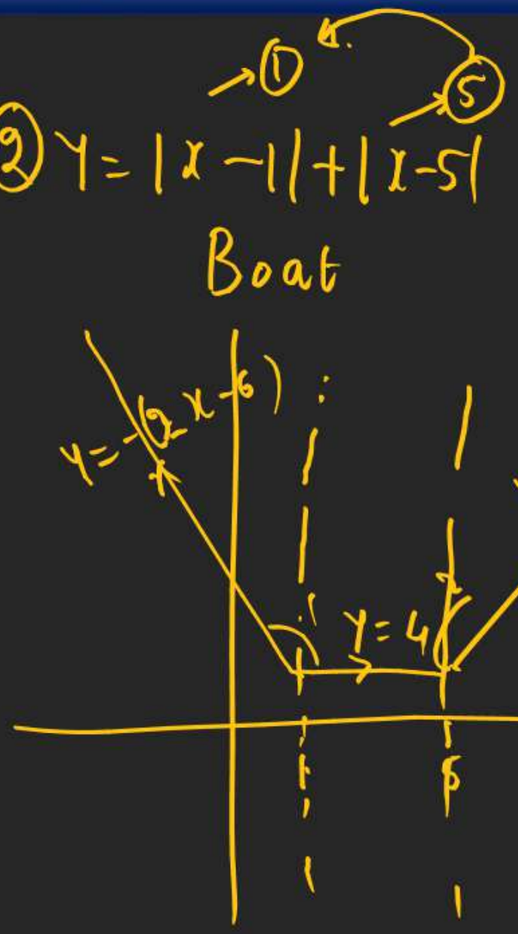
① $y = |x+2|$

↳ T.P. → $x = -2$



② $y = |x-1| + |x-5|$

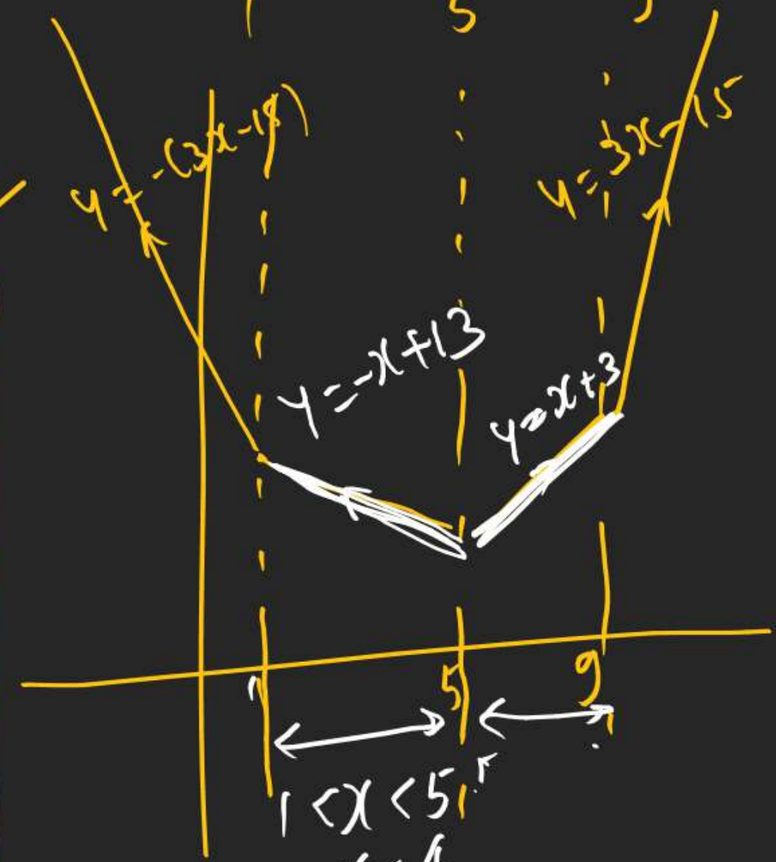
Boat



$|4-1| + |4-5| + |4-9|$

⊕ ⊖ ⊖

③ $y = |x-1| + |x-5| + |x-9|$



$y = x - 1 - (x-5) - (x-9)$

$y = -x + 13$

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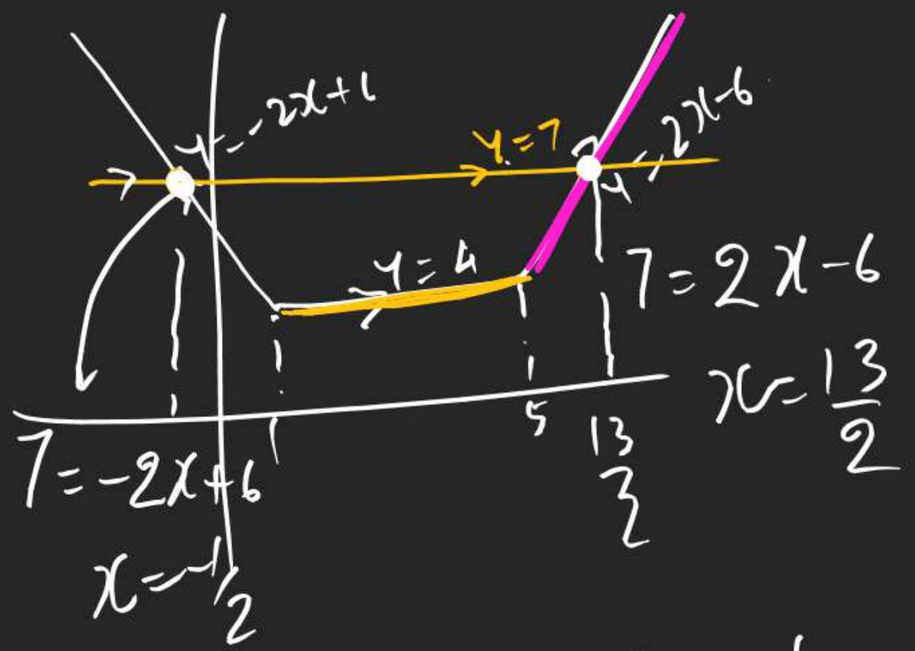
RELATION FUNCTION

Boat

Q. Solve $|x-1|+|x-5| = 7$

$y = |x-1|+|x-5|$ → Boat, $y = 7$ → LINE



$7 = 2x - 6$

$x = \frac{13}{2}$

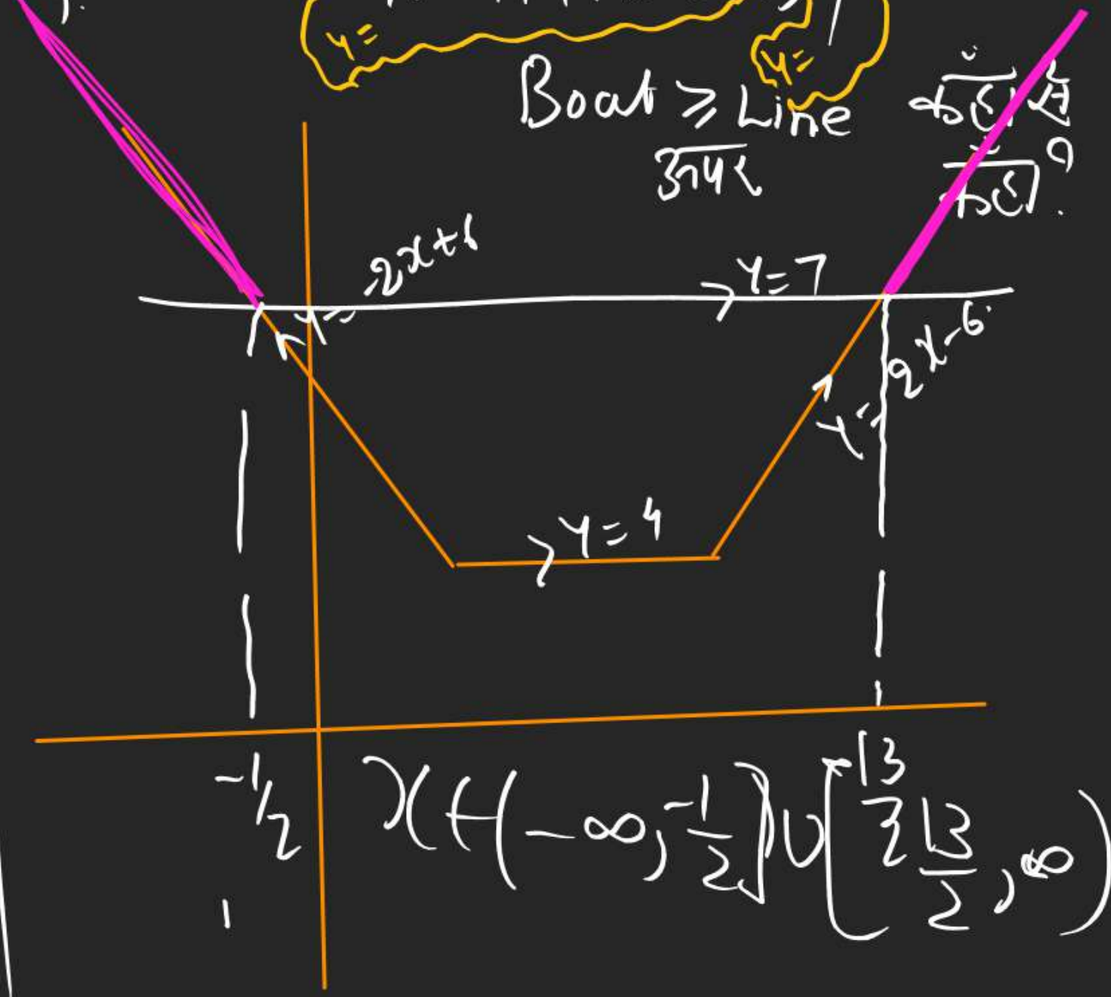
$x = \frac{13}{2}, -\frac{1}{2}$

Q. Solve $|x-1|+|x-5| \geq 7$

$y = |x-1|+|x-5|$, $y = 7$

Boat ≥ Line

ऊपर कहाँ से कहाँ तक?



$x \in (-\infty, -\frac{1}{2}] \cup [\frac{13}{2}, \infty)$

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RELATION FUNCTION

a = 33.

Q $\left|\left|\left|\left|x-1\right|+2\right|+3\right|+4\right|-5\Big| \le 20$ fn No of Integral values of x satisfying the above Eqn is a then a = ?

GMODA ≤ 20

$-20 \le \left|\left|\left|\left|x-1\right|+2\right|+3\right|+4\right|-5 \le 20$

$-15 \le \left|\left|\left|\left|x-1\right|+2\right|+3\right|+4\right| \le 25$

$\left|\left|\left|x-1\right|+2\right|+3\right|+4 \le 25$

GMODA ≤ 25

$-25 \le \left|\left|\left|x-1\right|+2+3\right|+4 \le 25$

$-29 \le \left|\left|\left|x-1+2+3\right| \le 21 \Rightarrow \left|\left|\left|x-1\right|+2\right|+3\right| \le 21$

GMODA ≤ 21

$-21 \le \left|\left|x-1\right|+2\right|+3 \le 21$

$\left|\left|x-1\right|+2\right| \le 18$

$\left|x-1\right| \le 16$

$-16 \le x-1 \le 16$

$-15 \le x \le 17$

$x = 33$ fn.

36 (30) (32) 34

PUMA

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RELATION FUNCTION

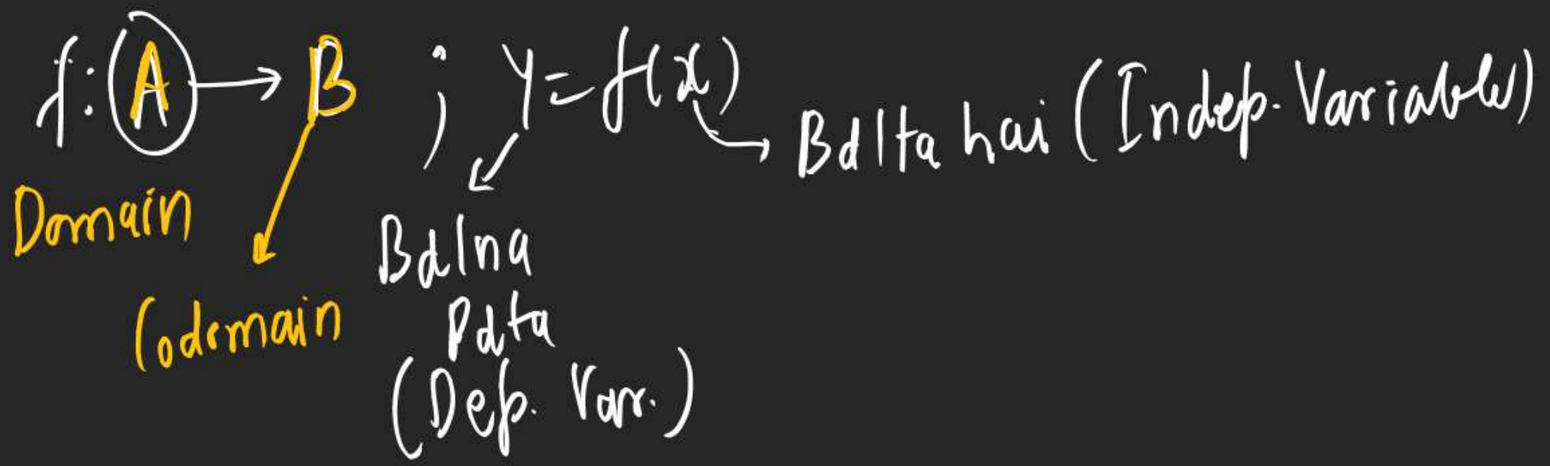
FUNCTION → If A & B are 2 Non empty Set such that each element of A is associated with a Unique element of B then this association (or respondance) is Rep. by $f: A \to B$ & this Association is known as {f, A into B} as fxn.

IIT/NIT

Competitive

Preparation

Mental Evolution.



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RELATION FUNCTION

$y = x + 2$

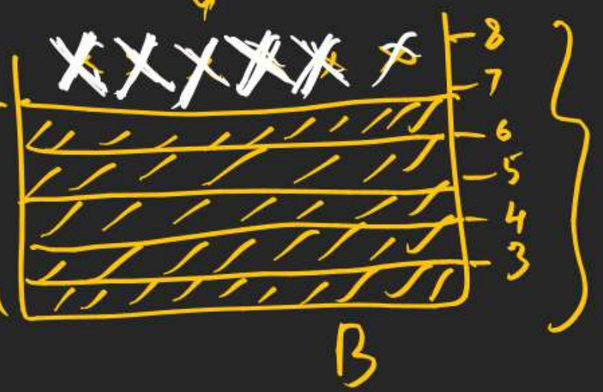
4 X 2

Onto fxn

1) codomain = Range

2) codomain > Range

Range



codomain

codomain < Range

∴ Into fxn

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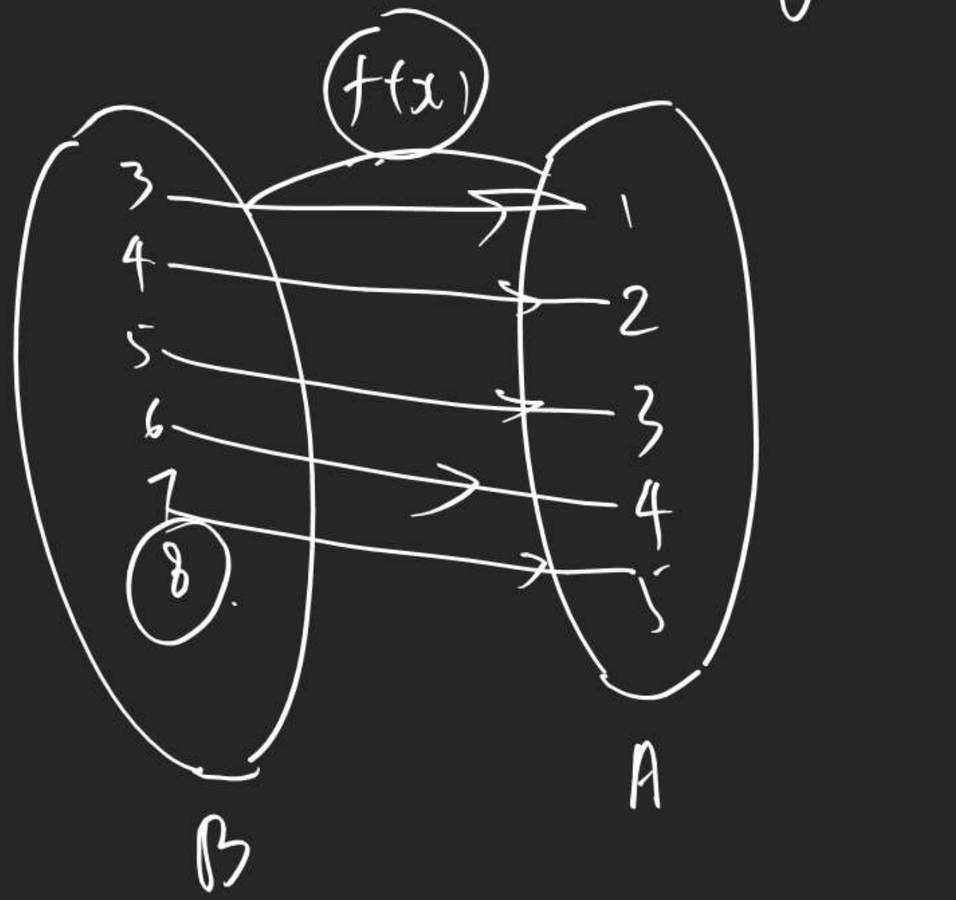
RELATION FUNCTION

$f: A \to B : y = f(x)$

$f: B \to A \quad y = f^{-1}(x)$

$f^{-1}(x)$ not defined



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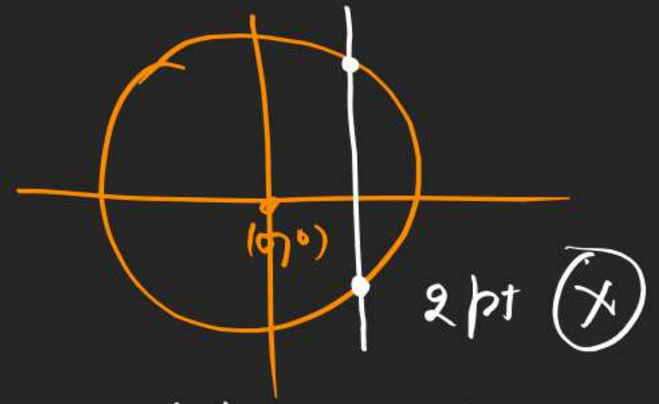
RELATION FUNCTION

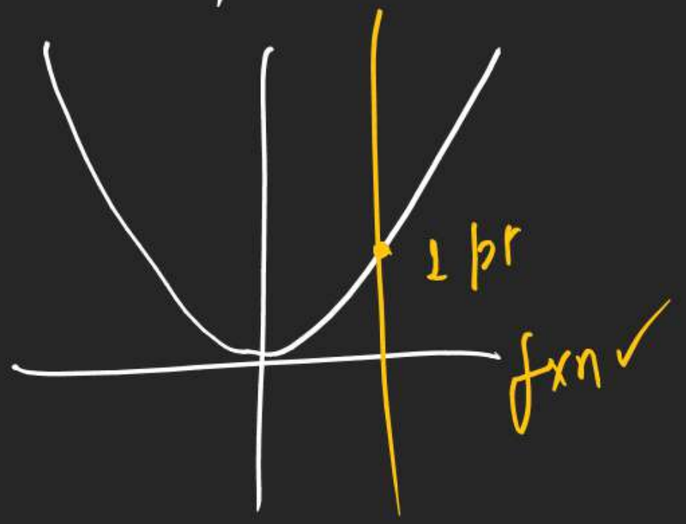
Testing of a fxn.

Q $x^2+y^2=9$ — $r=3$
fxn or, not

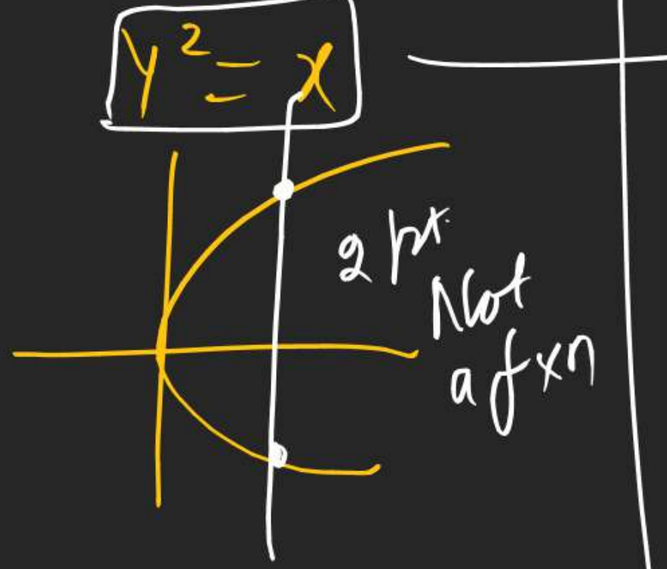


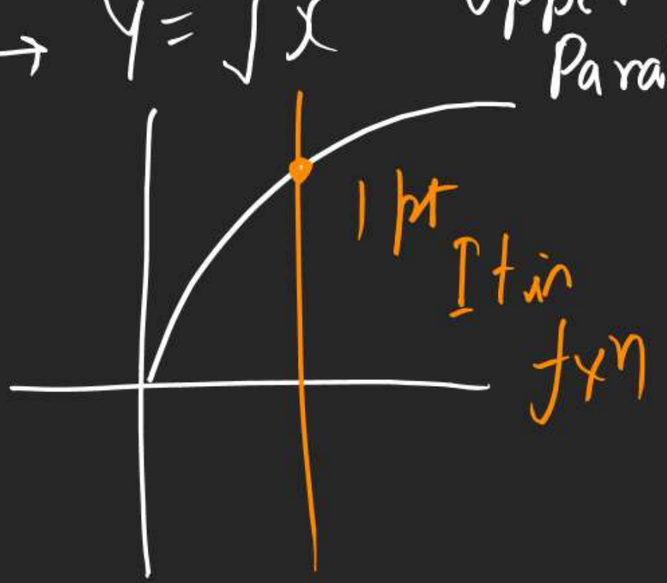
(A) **Vertical line Test** → If graph of fxn is cut by a vertical line at 1 pt. only then it is a fxn.
otherwise not.

$Y = x^2$



$y^2 = x$ → $Y = \sqrt{x}$ Upper Parabola





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RELATION FUNCTION

2 R_K.

A) $y^2 = x \rightarrow y = \pm\sqrt{x}$

$y = \sqrt{x}$

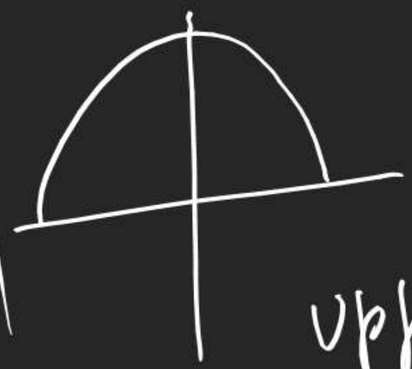
$y = -\sqrt{x}$

(B) $x^2 + y^2 = 9$

$y^2 = 9 - x^2$

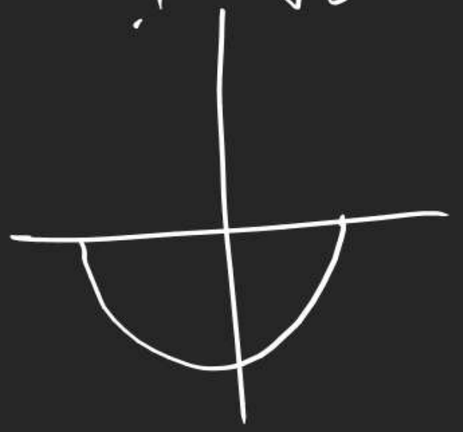
$y = \pm\sqrt{9 - x^2}$

$y = \sqrt{9 - x^2}$



Upper Circle

$y = -\sqrt{9 - x^2}$



lower Circle

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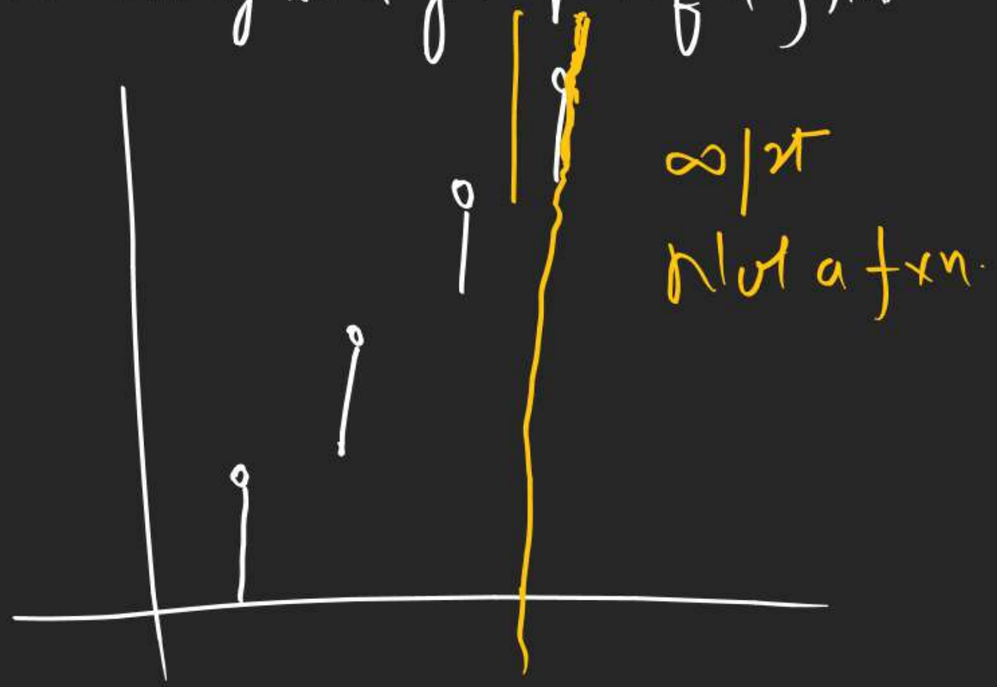
RELATION FUNCTION

Q following is a graph of a fxn



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RELATION FUNCTION

Graph of a fxn

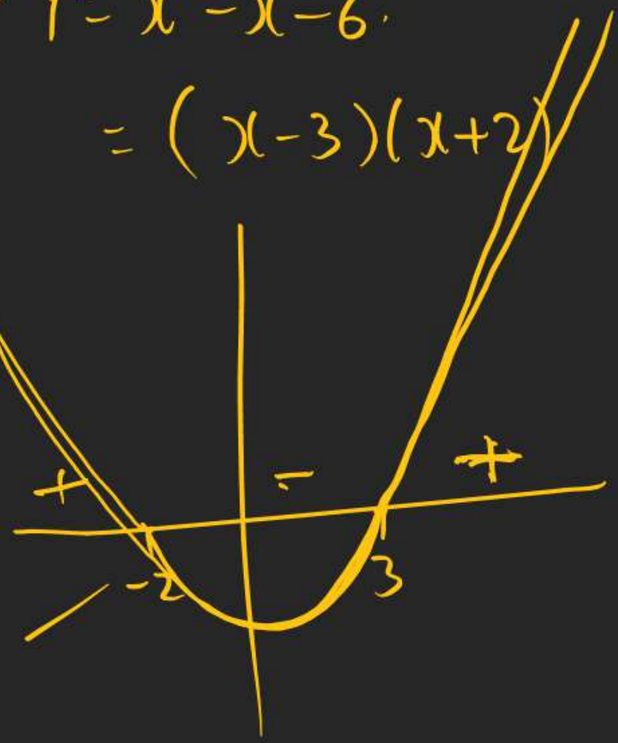
- Wavy Curve Method
- Transformation ✓
- Monotonocity Based [Light Touch]

Wavy Curve Method :→ This method is usefull only when given fxn is factorisable.

Graph.

① $y = x^2 - x - 6$.

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



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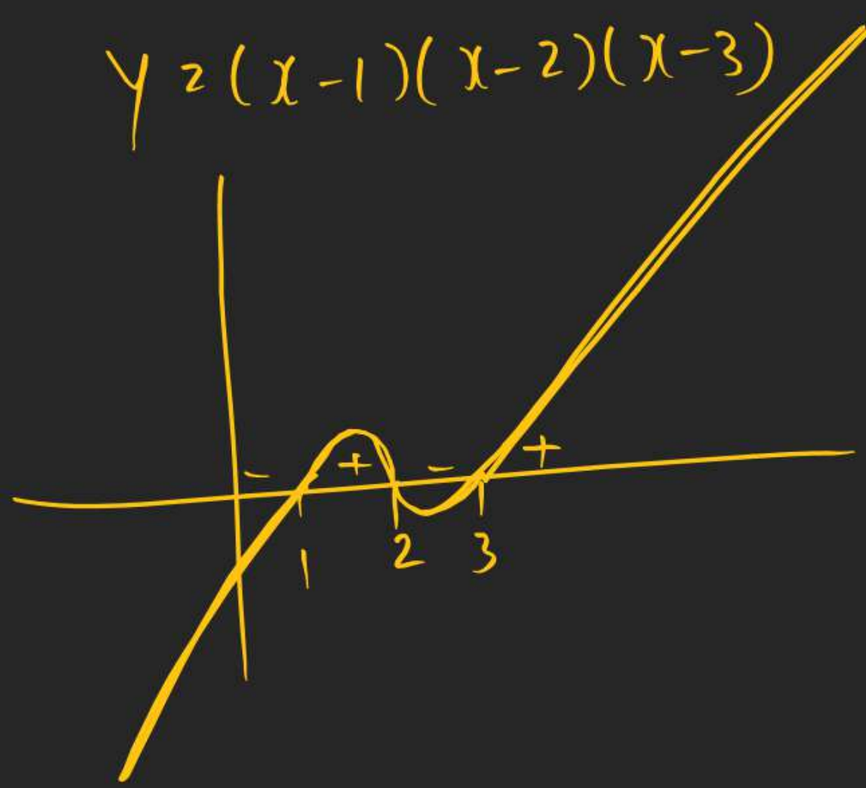
RELATION FUNCTION

② $y = x^3 - 6x^2 + 11x - 6$

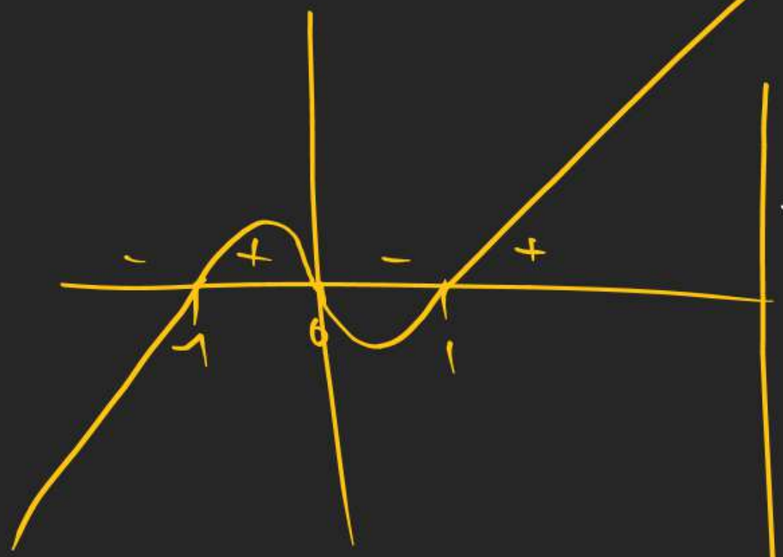
$y = (x-1)(x-2)(x-3)$



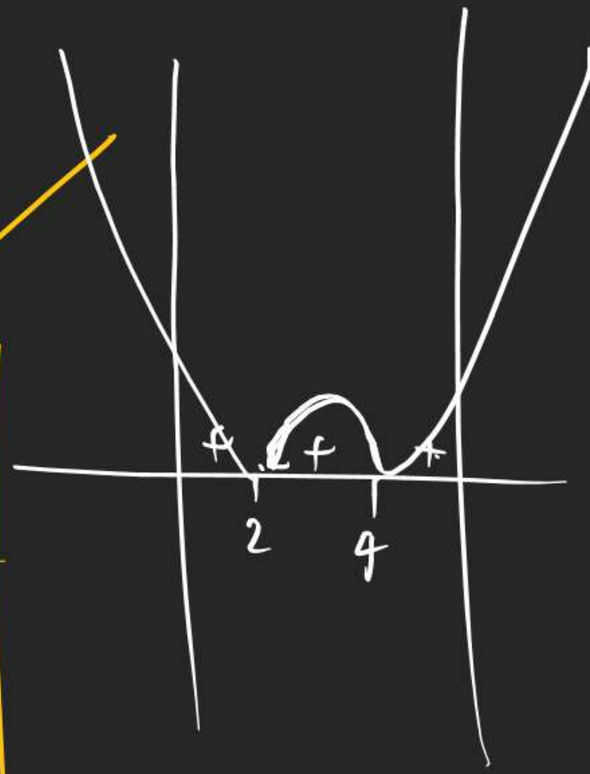
③ $y = x^3 - x$

$y = (x)(x^2-1)$

$= (x)(x-1)(x+1)$



④ $y = (x-2)^2(x-4)^4$



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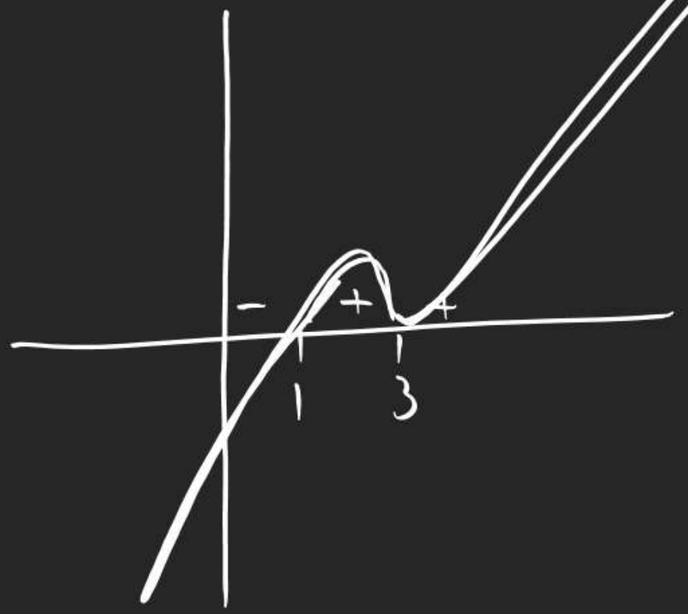
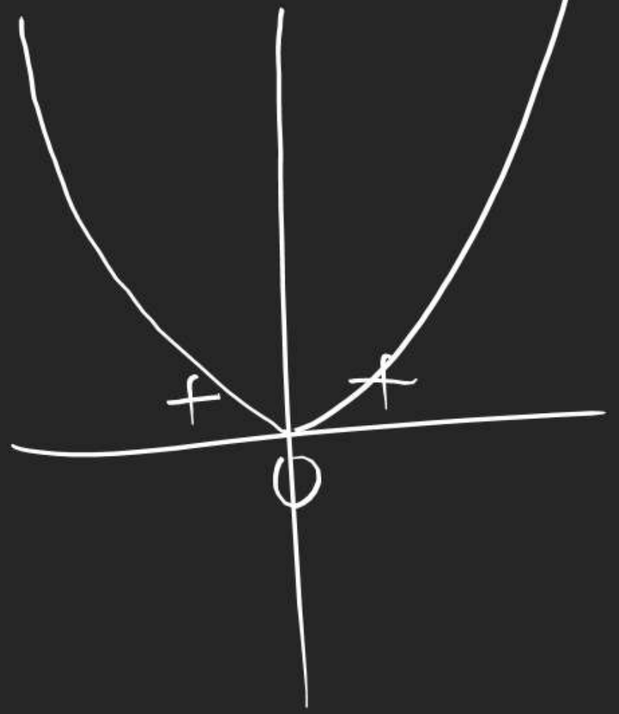
RELATION FUNCTION

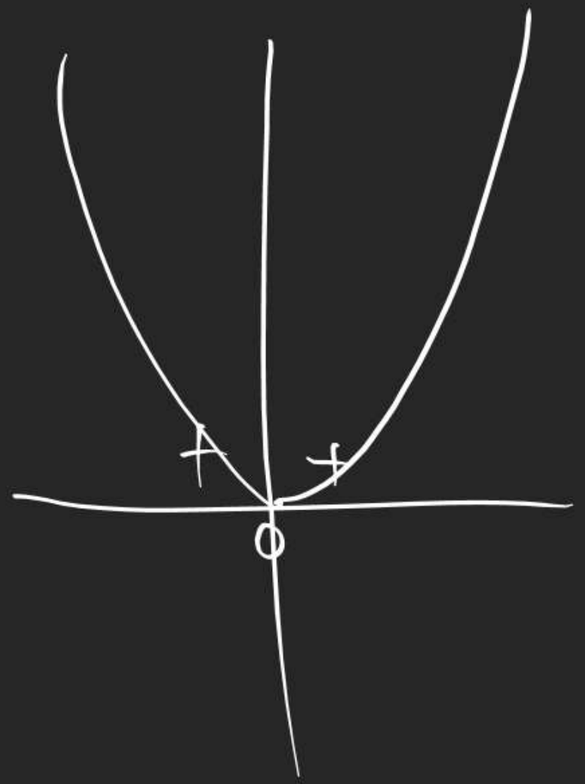
(5) $y=(x-1)^3(x-3)^4$



⑥ $y=(x)^2$



$y=(x)^{2022}$



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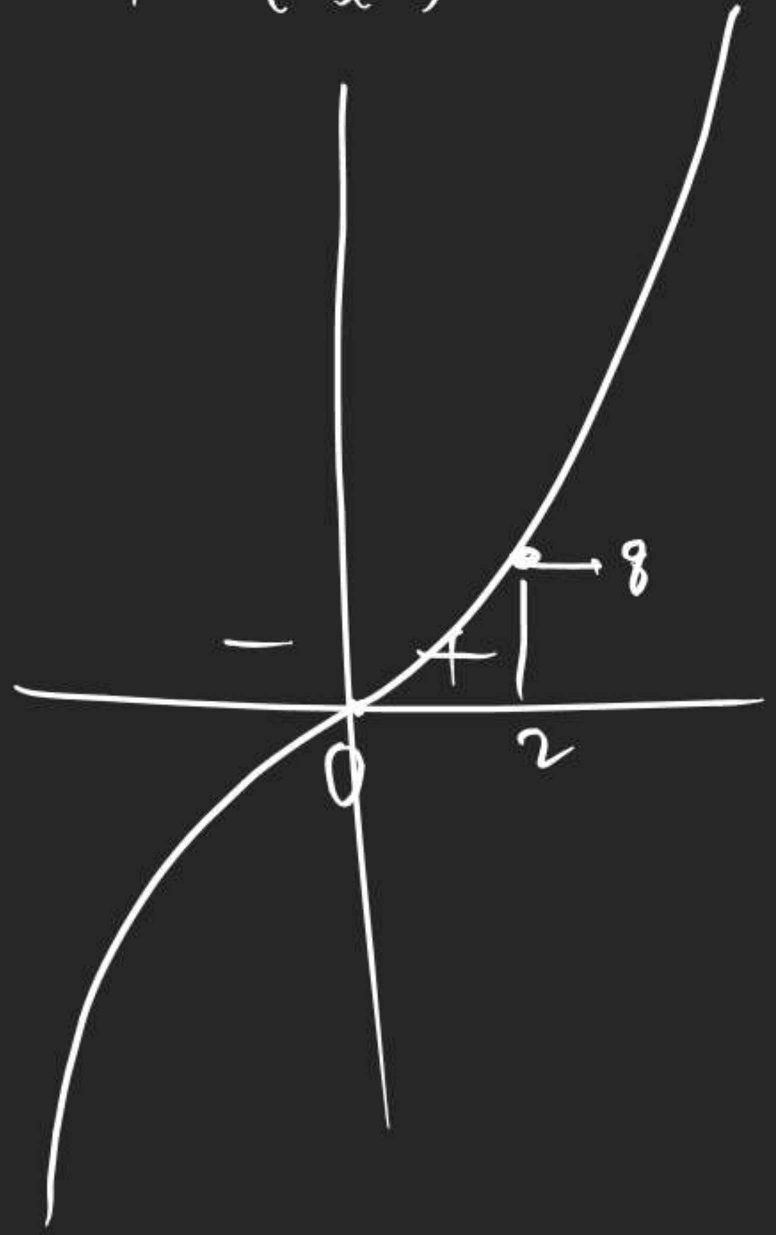
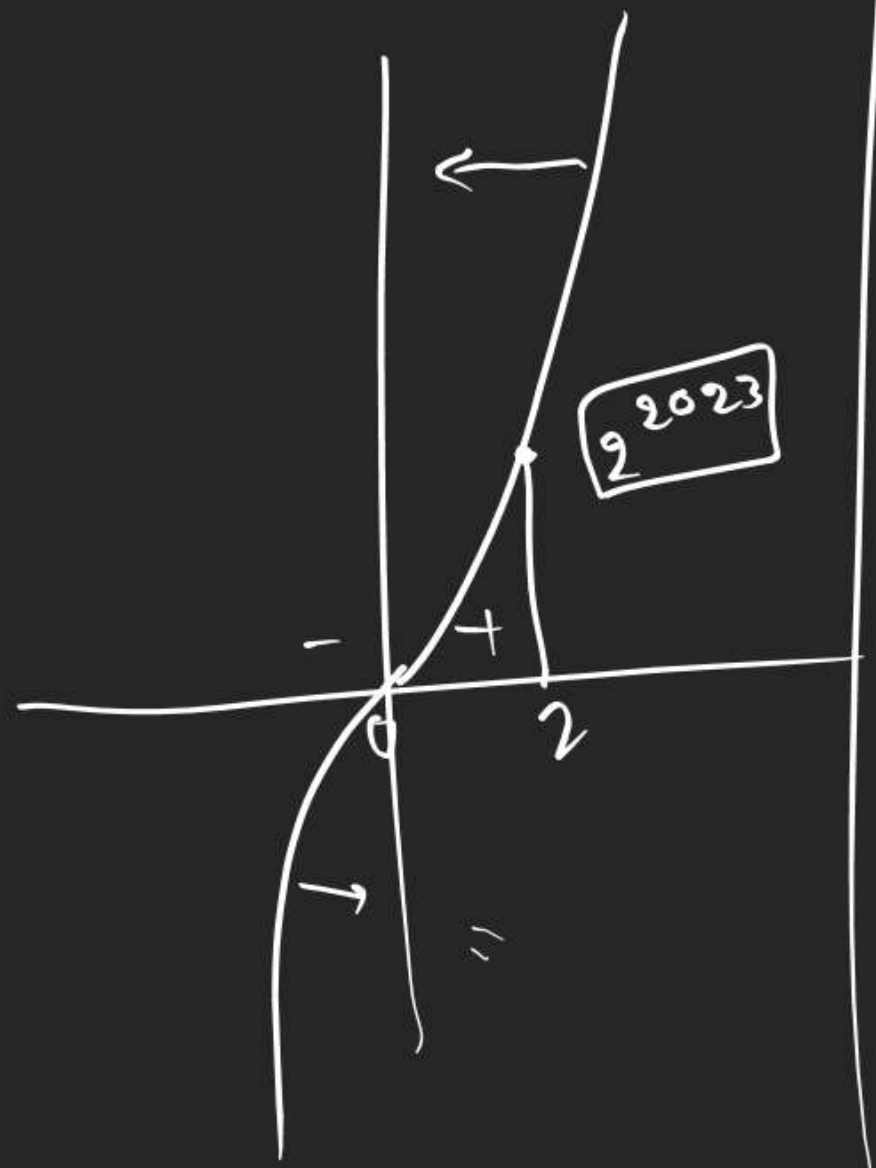
⑦ $y = (x)^3$

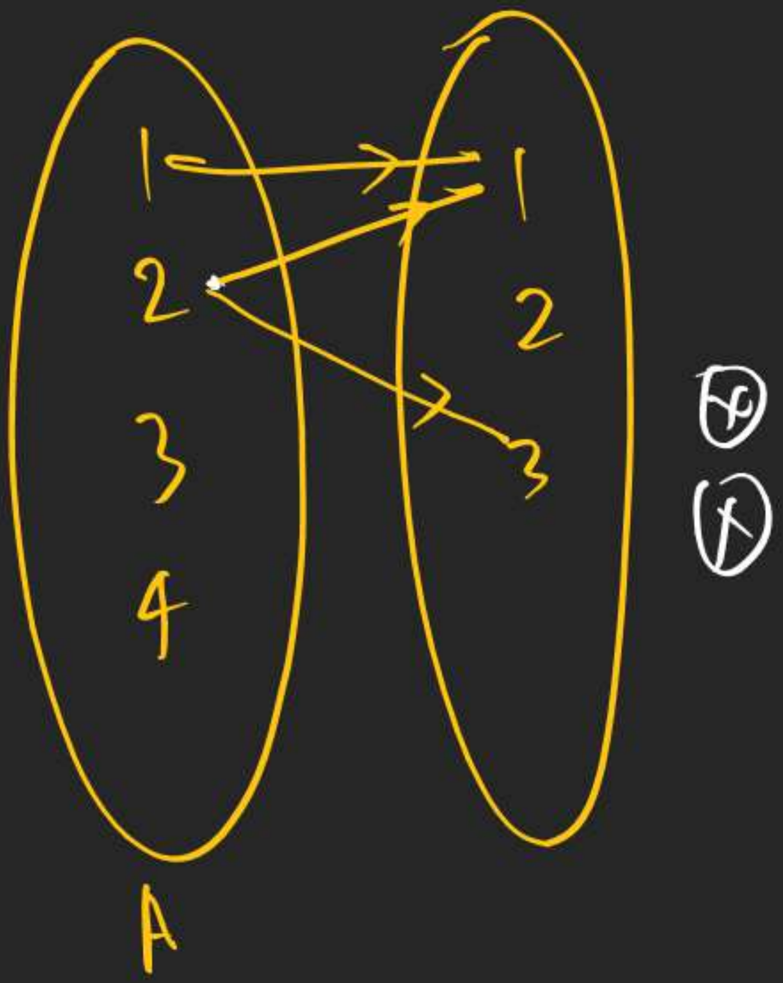


$y = (x)^{2023}$



Q $f = \{(1,1)(2,1)(2,3),(3,2),(4,3)\}$

is a fxn or not?



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Mapping Method