HW

Q find Dom of

(1) $y = \frac{1}{\sqrt{1-|x|}}$

(2) $y = \frac{1}{1-|x|}$ ← $\frac{1}{f(x)}$, $f(x) \neq 0$

(3) $y = \sqrt{2-2x+x^2}$ → $\sqrt{f(x)}$ → $f(x) \geq 0$

$-1 \leq \frac{x^2}{2} \leq 1$

AT Pgmo: $-2 \leq x^2 \leq 2$, −ve ≤ +ve

$x^2 \leq 2$

$\sqrt{x^2} \leq \sqrt{2}$

$|x| \leq \sqrt{2}$

$-\sqrt{2} \leq x \leq \sqrt{2}$ $\quad x \in [-\sqrt{2}, \sqrt{2}]$

(4) $y = \sqrt{2-|x-3|}$

(5) $y = \sin^{-1}\left(\frac{x^2}{2}\right)$

(6) $y = \cos^{-1}(4x-1)$

7) If

$$f(x) = \frac{(x-1)^{10000}\left(x-\frac{2}{3}\right)^{57}(x-7)^{4}\left(x+\frac{8}{7}\right)^{927}}{(x+3)^{17}(x-2)^{6}(x+6)^{12}}$$

then $x \in$ ___ if $f(x) > 0$

(8) find Dom of

$$y = \sqrt{\frac{1-|x|}{2-|x|}}$$

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RELATION FUNCTION

① $y = \frac{1}{\sqrt{1-|x|}}$ ← $\frac{1}{\sqrt{f(x)}}$ $f(x) > 0$

$1 - |x| > 0$

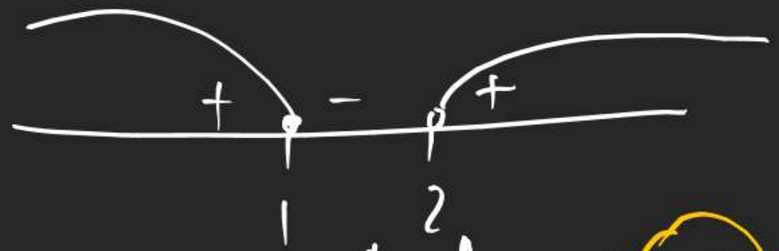
$\Rightarrow |x| < 1$

$-1 < x < 1$

(8) Good

Dom of $y = \sqrt{\frac{1-|x|}{2-|x|}} \rightarrow \sqrt{f(x)}$ (+ve)

$\frac{1-|x|}{2-|x|} \geq 0 \Rightarrow \frac{(|x|-1)}{(|x|-2)} \geq 0$



$|x| \leq 1$ ∪ $|x| \geq 2$

$-1 \leq x \leq 1$ ∪

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

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RELATION FUNCTION

$$|x| = \begin{cases} x & x \geq 0 \\ -x & x < 0 \end{cases}$$

$|x| = x \quad x \geq 0$

$|x| = -x \Rightarrow x < 0$

Q $|x+3| = x+3$ then $x \in ?$

And Vala as it is Bahar AAgya

$\Rightarrow x+3 \geq 0$

$x \geq -3 \Rightarrow x \in [-3, \infty)$

Q $|x-1| = 1-x$ then $x \in ?$

$|x-1| = -(x-1)$

And vala Minus K Sath.

$x-1 \leq 0 \Rightarrow x \leq 1 \Rightarrow x \in (-\infty, 1]$

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RELATION FUNCTION

Q $|x^2-x-2| = 2+x-x^2$ then $x \in ?$

$|x^2-x-2| = -(x^2-x-2)$

→ Andr Value minus k Sath.

Sara Perfectly Yad Rakho

$x^2-x-2 \leq 0$ (Correct)

$(x-2)(x+1) \leq 0$

$-1 \leq x \leq 2$

$x \in [-1, 2]$

Not $x \in \left(\frac{1}{2}, \frac{5}{6}\right)$

Rem :-

If $|f(x)+g(x)| = |f(x)|+|g(x)|$

then $f(x) \geq 0$ & $g(x) \geq 0$

Q $f(x) = \frac{1}{\sqrt{\frac{1}{2}-|3x-2|}}$ find Dom?

$\frac{1}{2}-|3x-2| > 0$

$|3x-2| < \frac{1}{2}$ ⇒ $\left|x-\frac{2}{3}\right| < \frac{1}{6}$

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RELATION FUNCTION

Adv 9 $f(x) = \sqrt{||x-1|-5|-2}$ find Dom

$||x-1|-5|-2 \geq 0$

$||x-1|-5| \geq 2$

$|x-1|-5 \leq -2$ ∪ $|x-1|-5 \geq 2$

$|x-1| \leq 3$ ∪ $|x-1| \geq 7$

$x \in (-\infty, -6] \cup [-2, 4] \cup [8, \infty)$

Pls see again After Recording

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RELATION FUNCTION

1) $|x| = \begin{cases} x & x \geq 0 \\ -x & x < 0 \end{cases}$

2) $|x+7| = \begin{cases} x+7 & x+7 \geq 0 \\ -(x+7) & x+7 < 0 \end{cases}$

Kaam Use → Critical $x = -7$

$|x+7| = \begin{cases} x+7 & x \geq -7 \\ -(x+7) & x < -7 \end{cases}$

Jis dim x आएगा Critical से Bda होगा As it is Bahar Aayega.

Chhota Minus होगा

Q $|x-3| = \begin{cases} x-3 & x \geq 3 \\ -(x-3) & x < 3 \end{cases}$

Critical $x = 3$

Q $|x+3| = \begin{cases} x+3 & x \geq -3 \\ -(x+3) & x < -3 \end{cases}$

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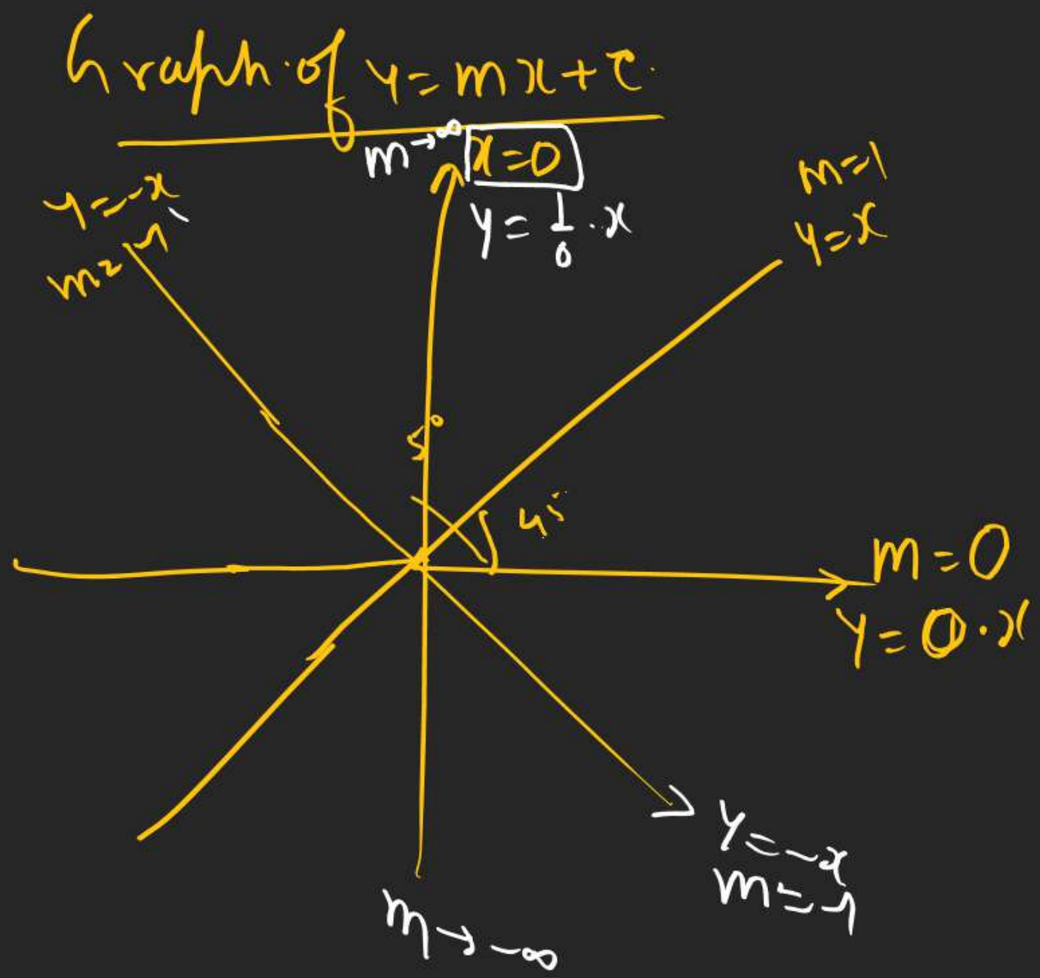
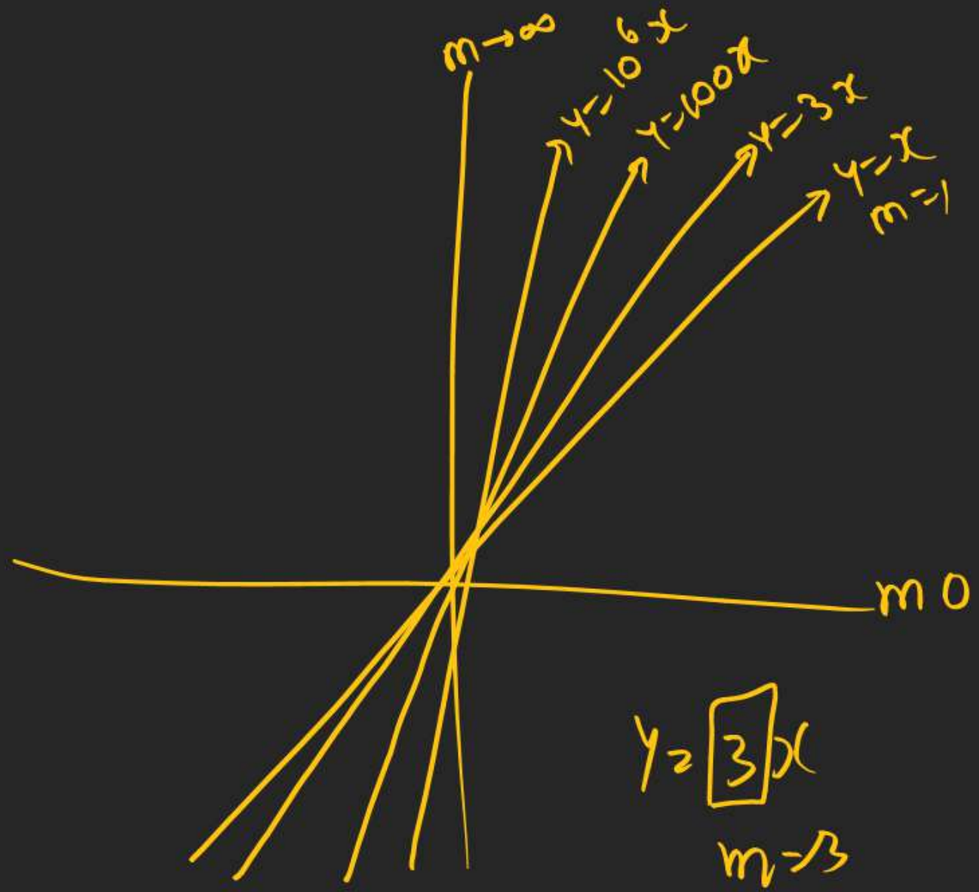
RELATION FUNCTION





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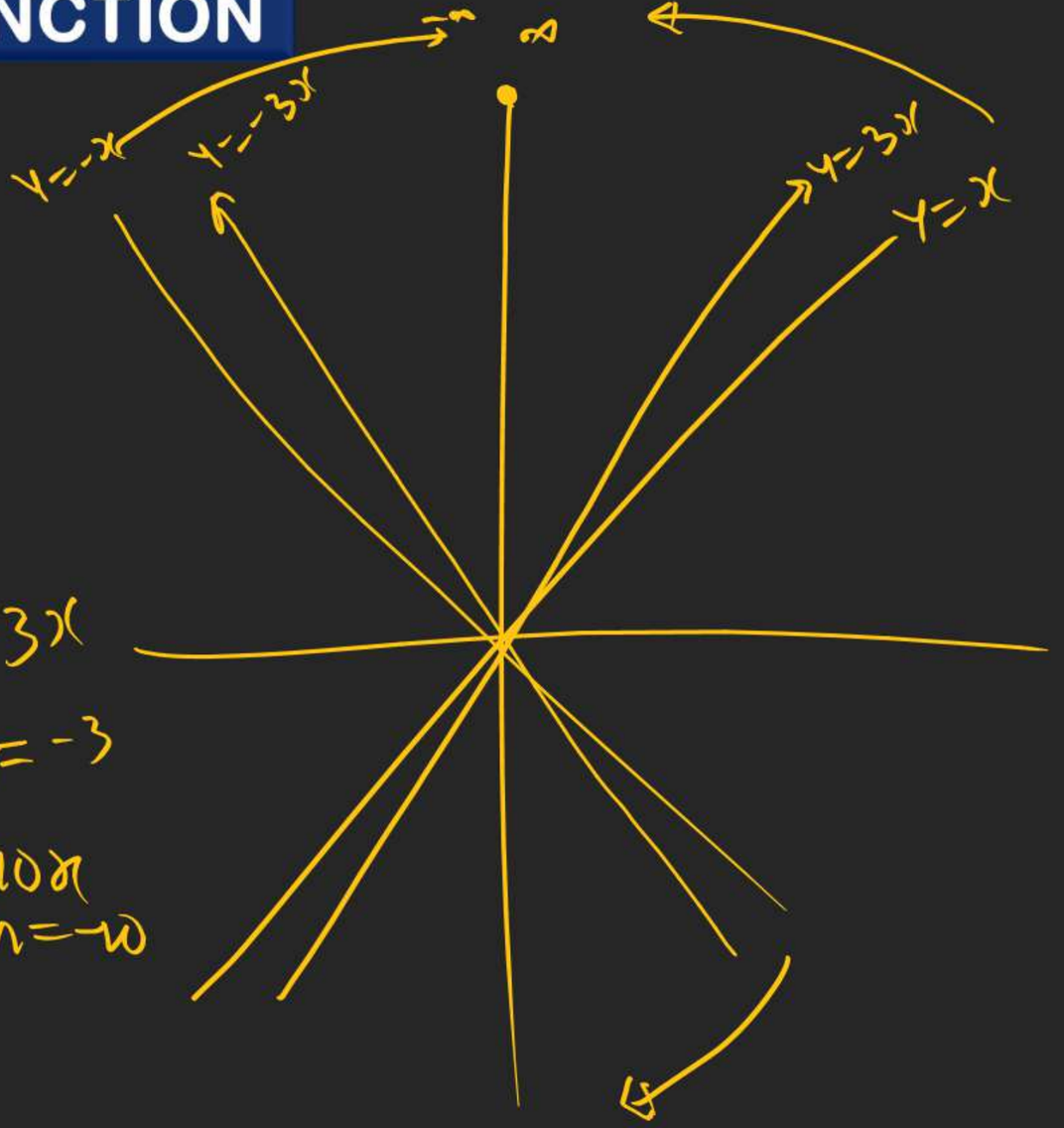
RELATION FUNCTION

$y = -3x$

$m = -3$

$y = -10x$

$m = -10$



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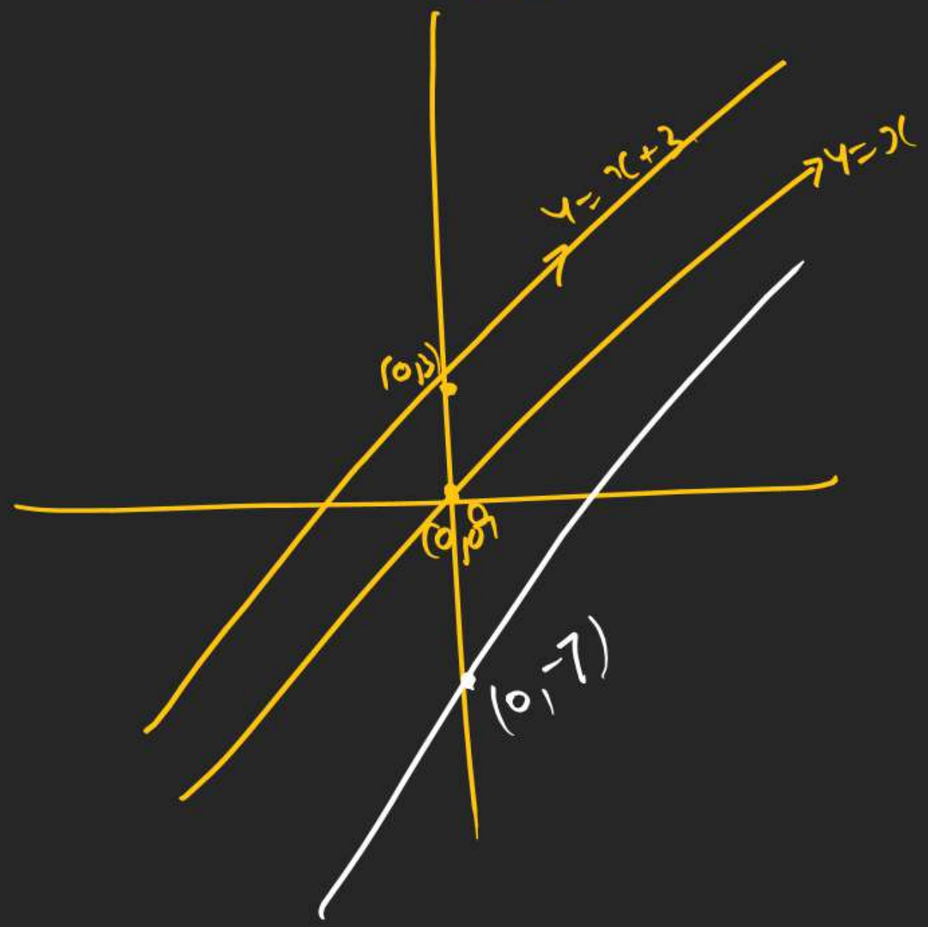
RELATION FUNCTION

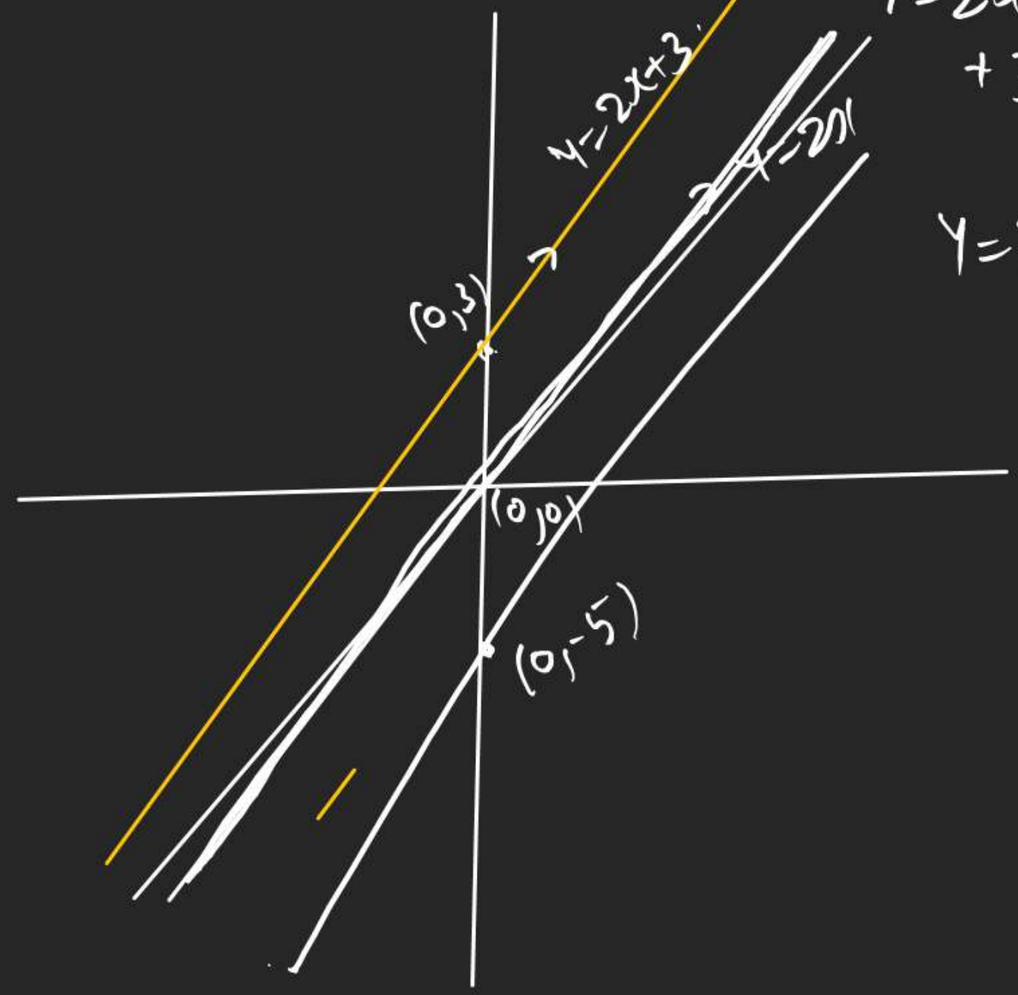
$y = x + 3$ ① $y = x$ $y = x - 7$



$y = 2x + 3$

$y = 2x$ + 3 U/p

$y = 2x - 5$



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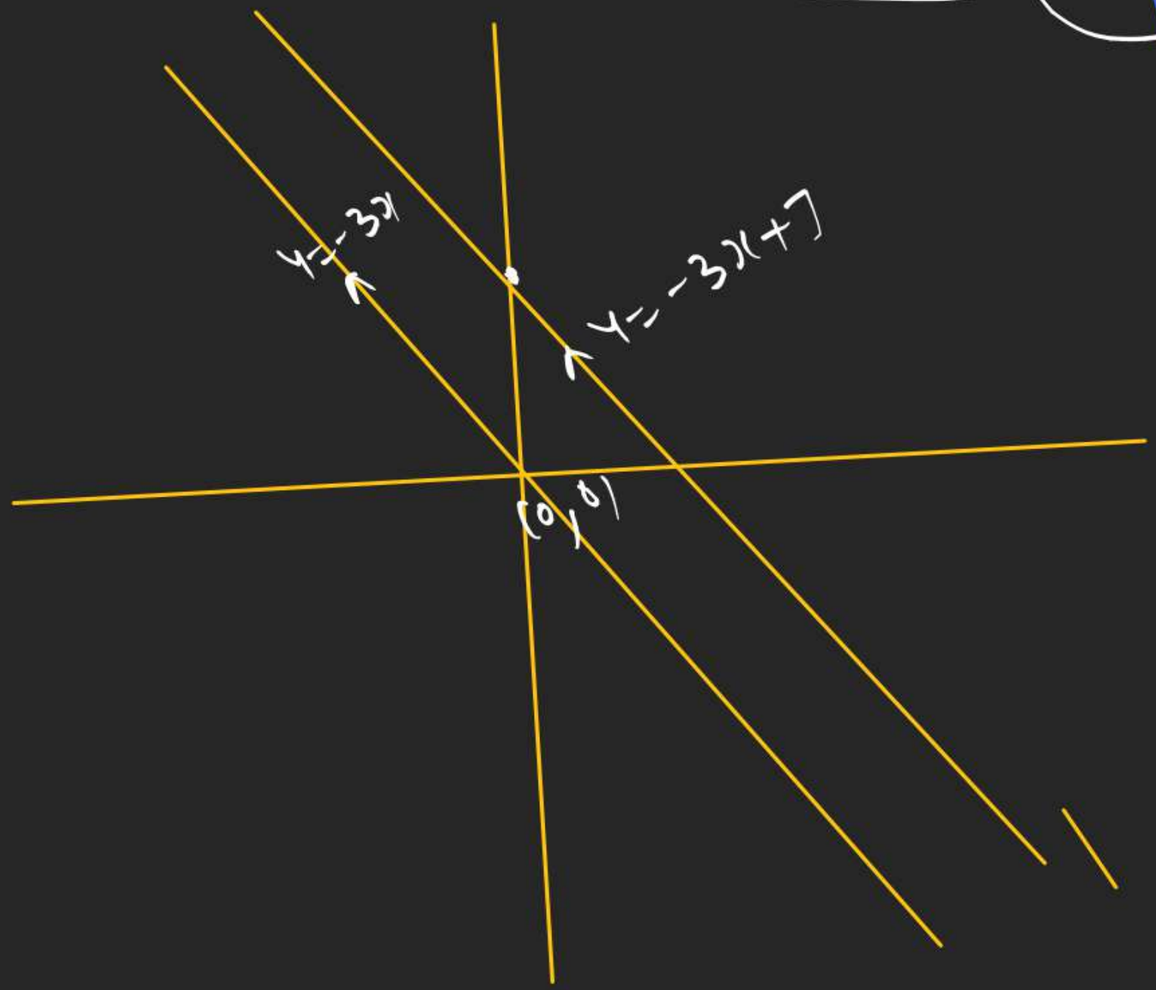
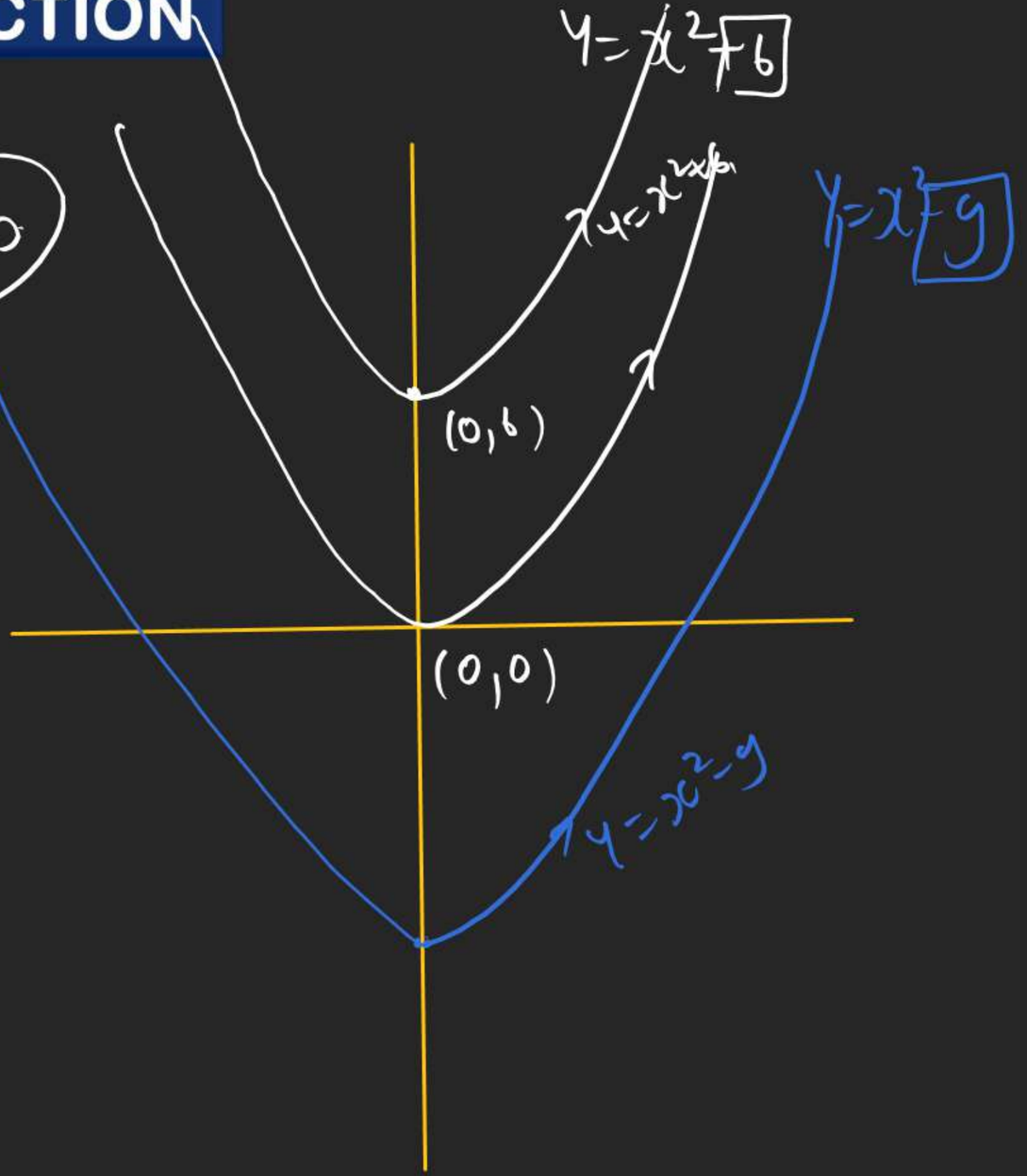
RELATION FUNCTION

$y = -3x + 7 \rightarrow y = -3x$ (+7 up)





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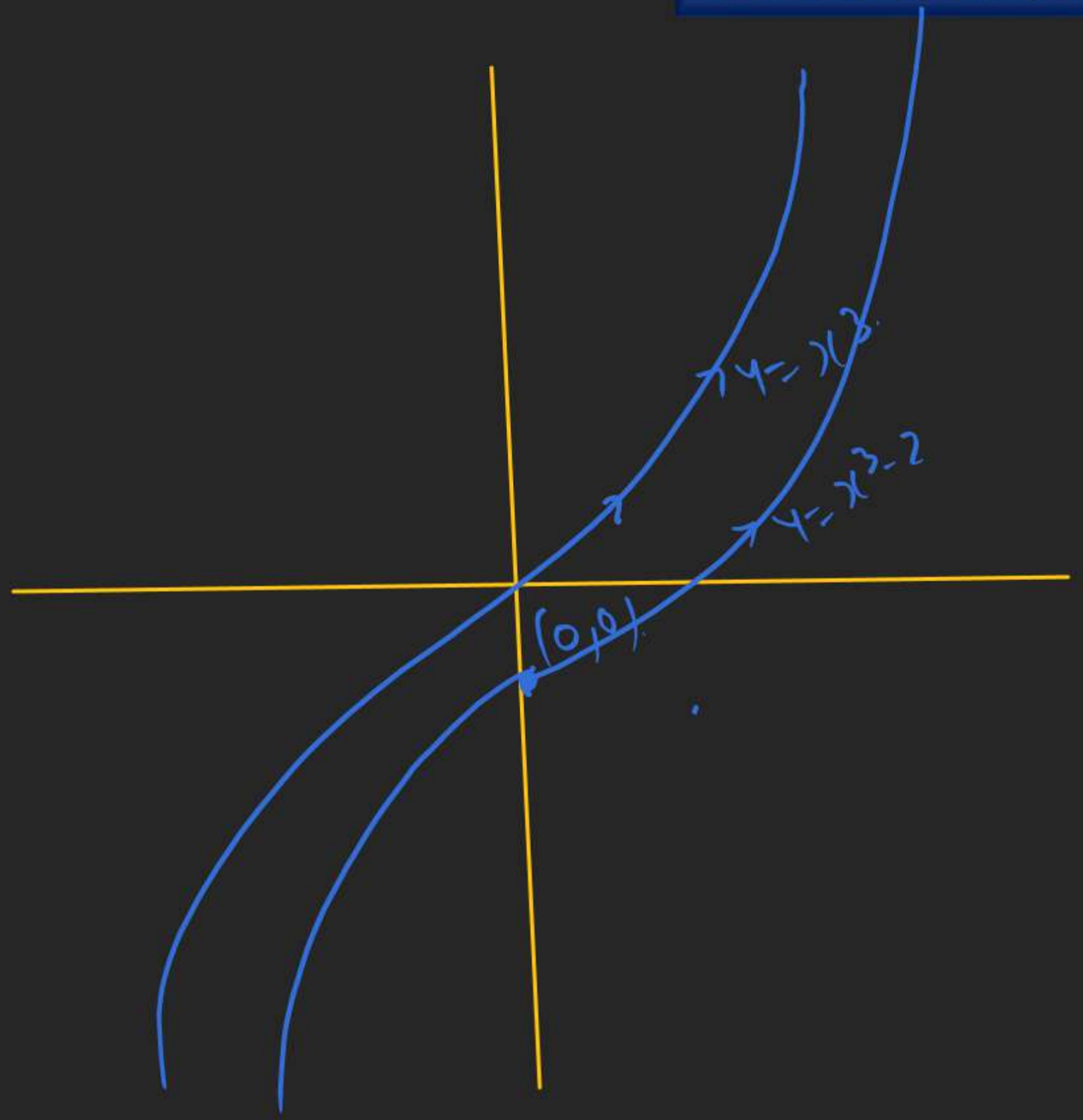
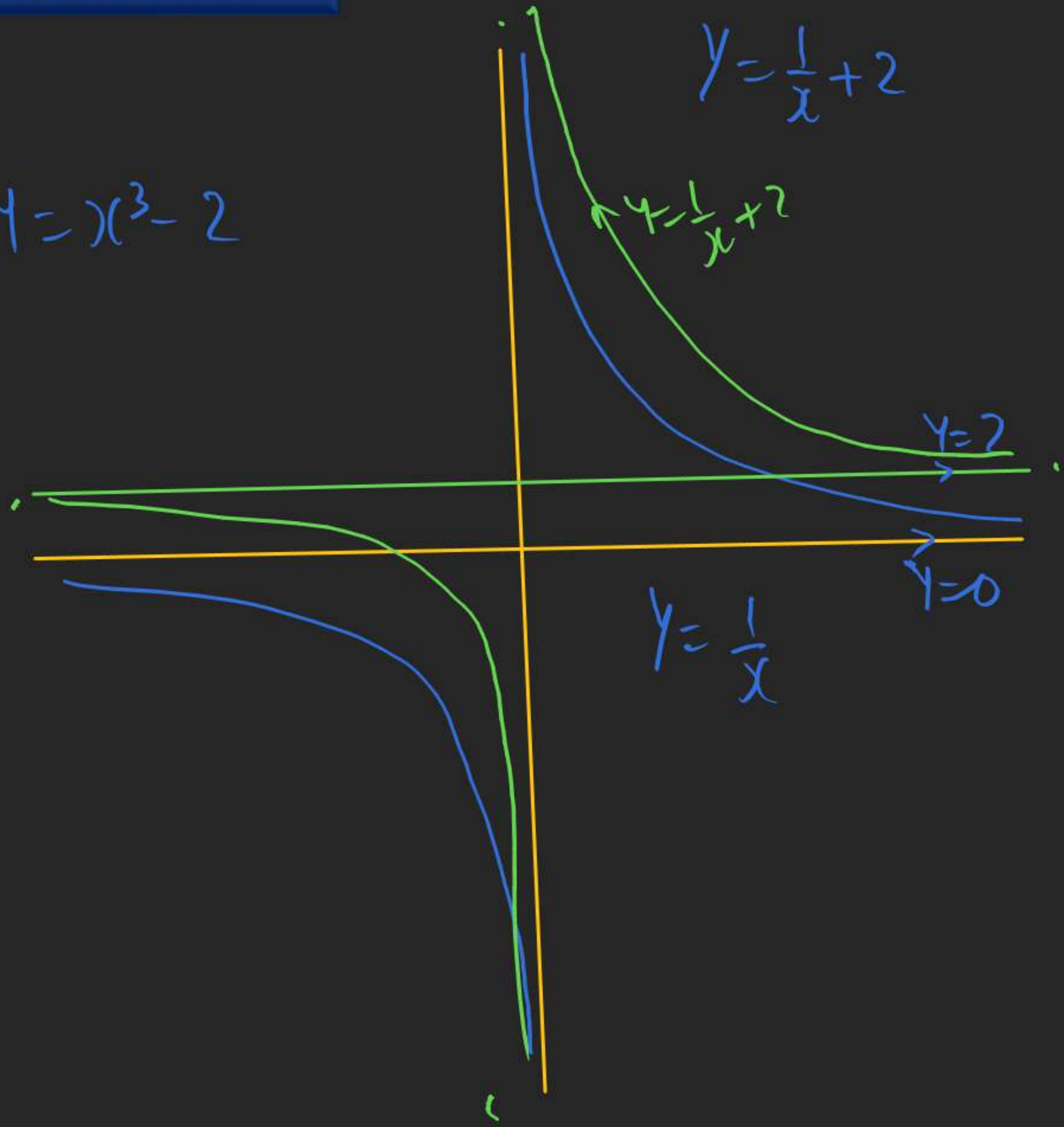
RELATION FUNCTION



$y=x^3-2$



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RELATION FUNCTION

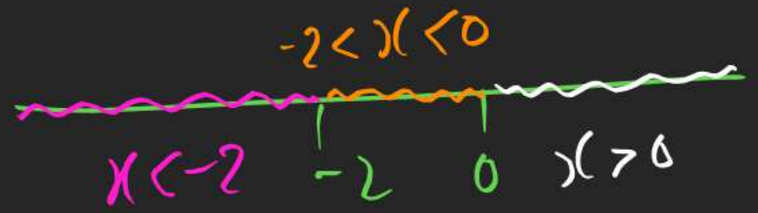
Think about a No

$y = |x| + |x+2|$ (0, −2)

Aliter

Define

① TP on No Line



(2) $|x| + |x+2| = \begin{cases} x + x + 2 \\ -x + (x+2) \\ -x - (x+2) \end{cases}$

3) $|x| + |x+2| = \begin{cases} 2x+2 & x \geq 0 \\ 2 & -2 < x < 0 \\ -(2x+2) & x \leq -2 \end{cases}$

$x \geq 0$ → $x = 1 \rightarrow |1|_{(+)} + |1+2|_{(+)}$

$-2 < x < 0$ → $x = -1 \rightarrow |-1|_{(-)} + |-1+2|_{(+)}$

$x < -2$ → $x = -3 \rightarrow |-3|_{(-)} + |-3+2|_{(-)}$

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RELATION FUNCTION

Q $f(x) = |x-1| + |x-3|$ defined?

$$|x-1| + |x-3| = \begin{cases} -(x-1)-(x-3) & x \le 1 \\ x-1-(x-3) & 1 < x < 3 \\ x-1+x-3 & x \ge 3 \end{cases}$$

$$|x-1| + |x-3| = \begin{cases} -2x+4 & x \le 1 \\ 2 & 1 < x < 3 \\ 2x-4 & x \ge 3 \end{cases}$$

$x \le 1$

$1 < x < 3$

$x \ge 3$

$x \le 1 \rightarrow x = 0$ $\quad |0-1| + |0-3|$ (⊖ ⊖)

$1 < x < 3 \rightarrow x = 2$ $\quad |2-1| + |2-3|$ (⊕ ⊖)

$x \ge 3 \rightarrow$ ④ $\quad |4-1| + |4-3|$ (⊕ ⊕)

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RELATION FUNCTION

$$|x-1|+|x-5| = \begin{cases} -2x+6 & x \le 1 \\ 4 & 1 < x < 5 \\ 2x-6 & x \ge 5 \end{cases}$$

(1) (5)

$$|x+2|+|x-2| = \begin{cases} -2x & x \le -2 \\ 4 & -2 < x < 2 \\ 2x & x \ge 2 \end{cases}$$

(-2) (2)

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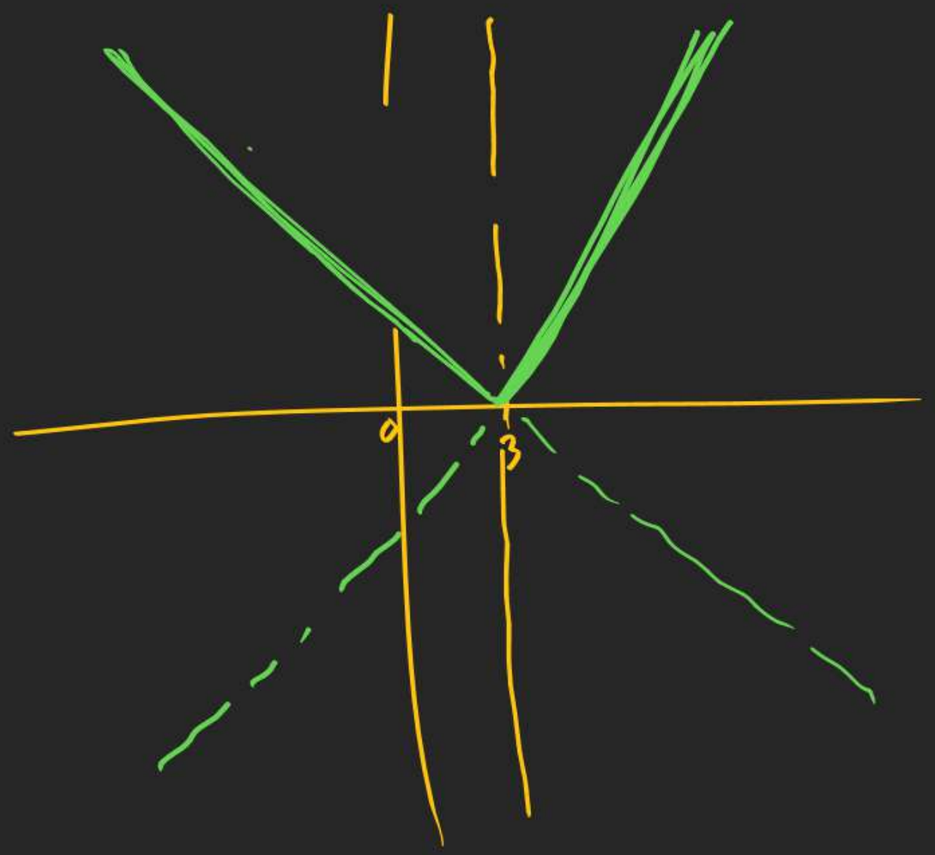
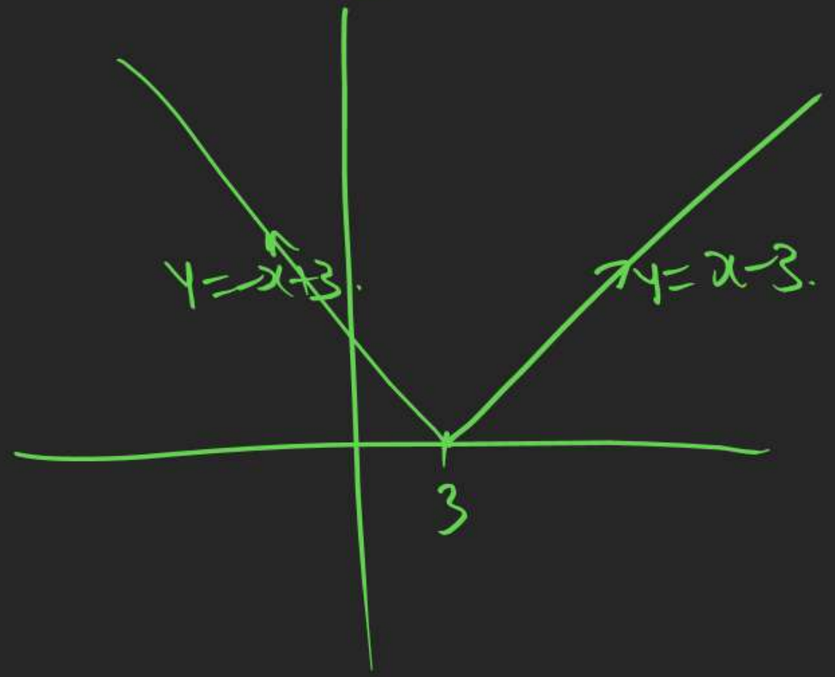
RELATION FUNCTION

$$y = |x-3| \quad (3) = \begin{cases} x-3 & x \geq 3 \\ -x+3 & x < 3 \end{cases}$$



$y = |x-3|$ (3)



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RELATION FUNCTION

$y = |x+5|$

-5

$y = -(x+5)$

$y = x+5$

-5

(2) $y = |x-1| + |x-3| = \begin{cases} 2x+4 & x \le 1 \\ 2 & 1 \le x < 3 \\ 2x-4 & x \ge 3 \end{cases}$

1 3

$y = -2x+4$

$y = 2$

$y = 2x-4$

1

3

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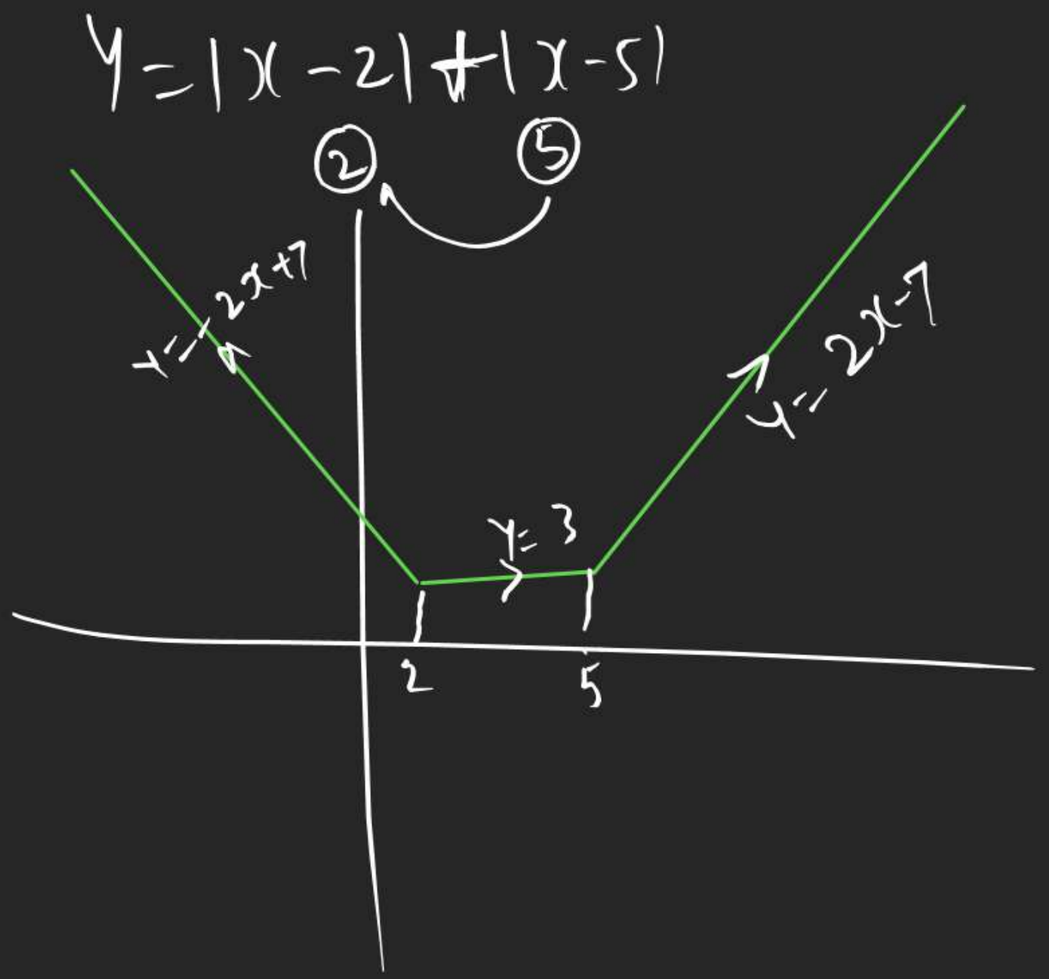
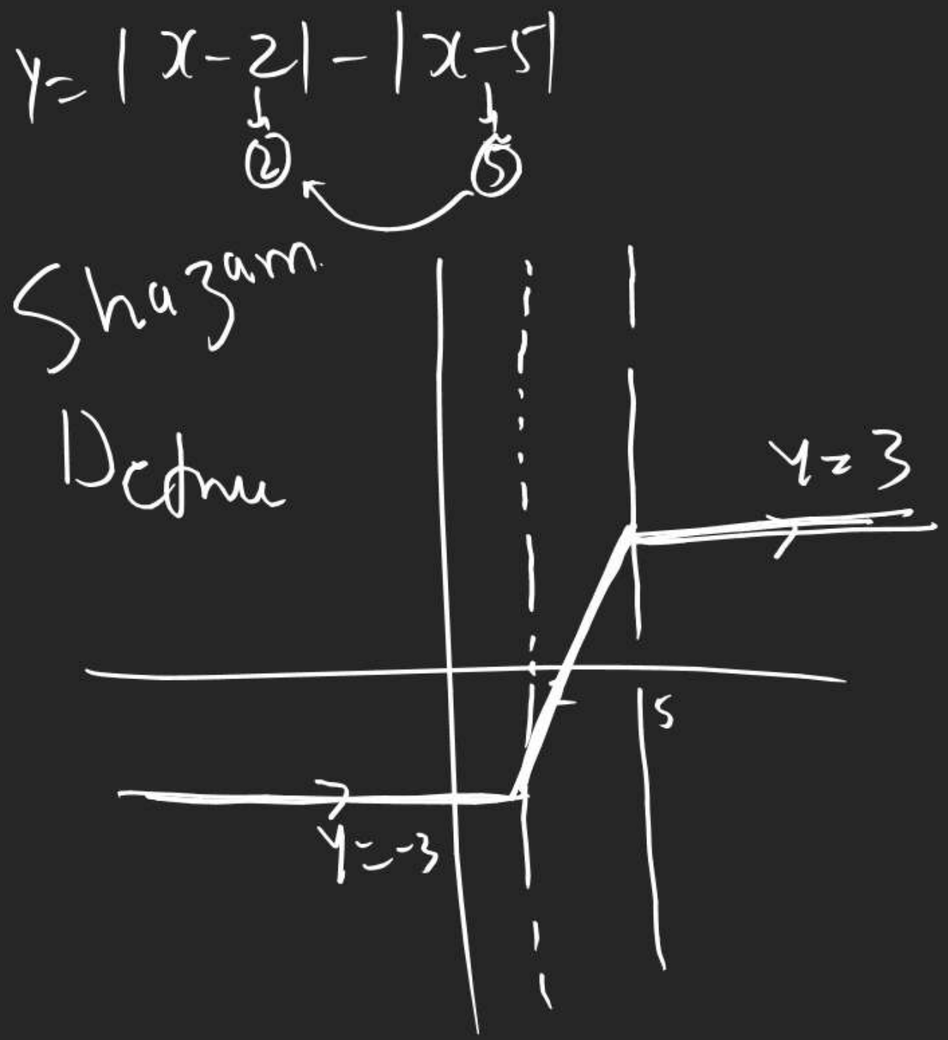
RELATION FUNCTION





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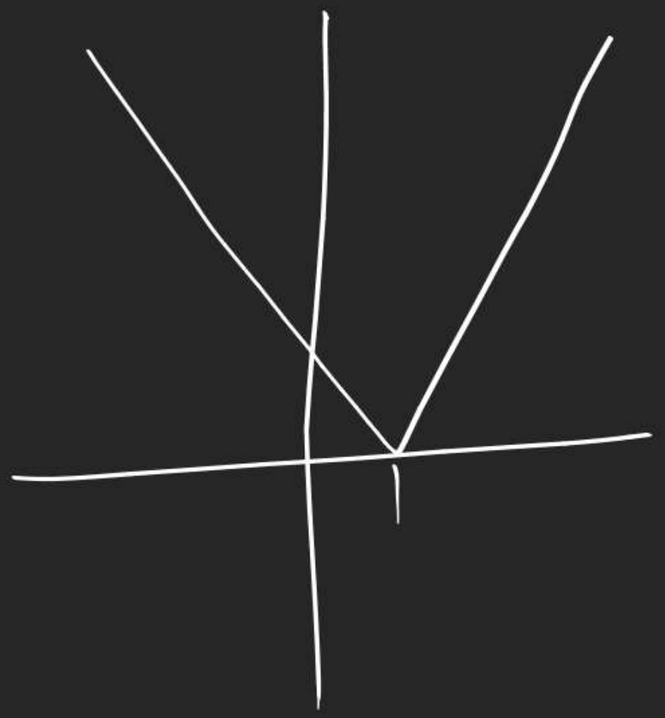
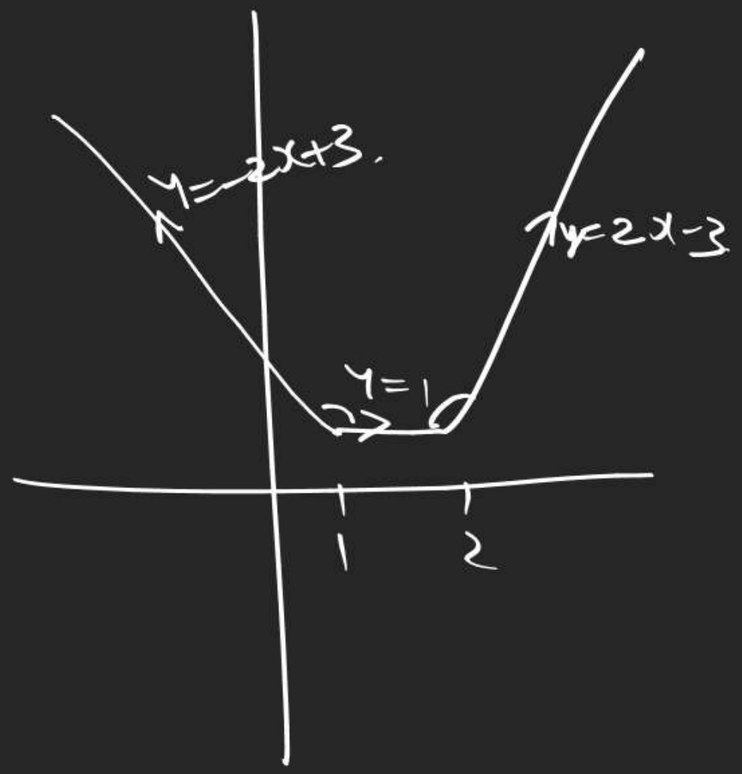
RELATION FUNCTION

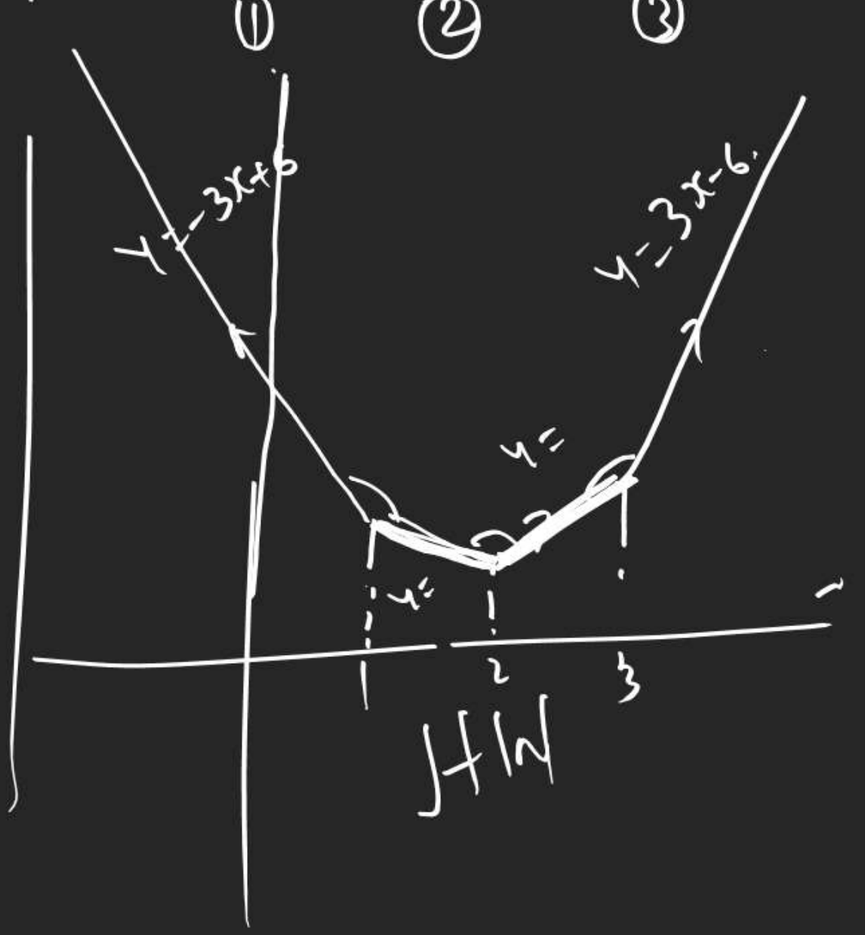
$y = |x-1|$



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



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



HW