Nishant Jindal

RELATION FUNCTION

① If $x = \log_{x-4}(x^2-11x+24)$ find D_f ?

② If $fx = \sin^{-1}(\log_e x)$,, ?

③ $f(x) = \sqrt{\frac{\log_{\frac{1}{3}} 3^{|x-2|}}{|x|}}$ find D_f ?

④ $f(x) = \frac{1}{\sqrt{\log_{\frac{1}{2}}(x^2-7x+13}}$

⑤ $f(x) = \sqrt{2^{\sin^{-1}(\log_3 x)}}$ find D_f ?

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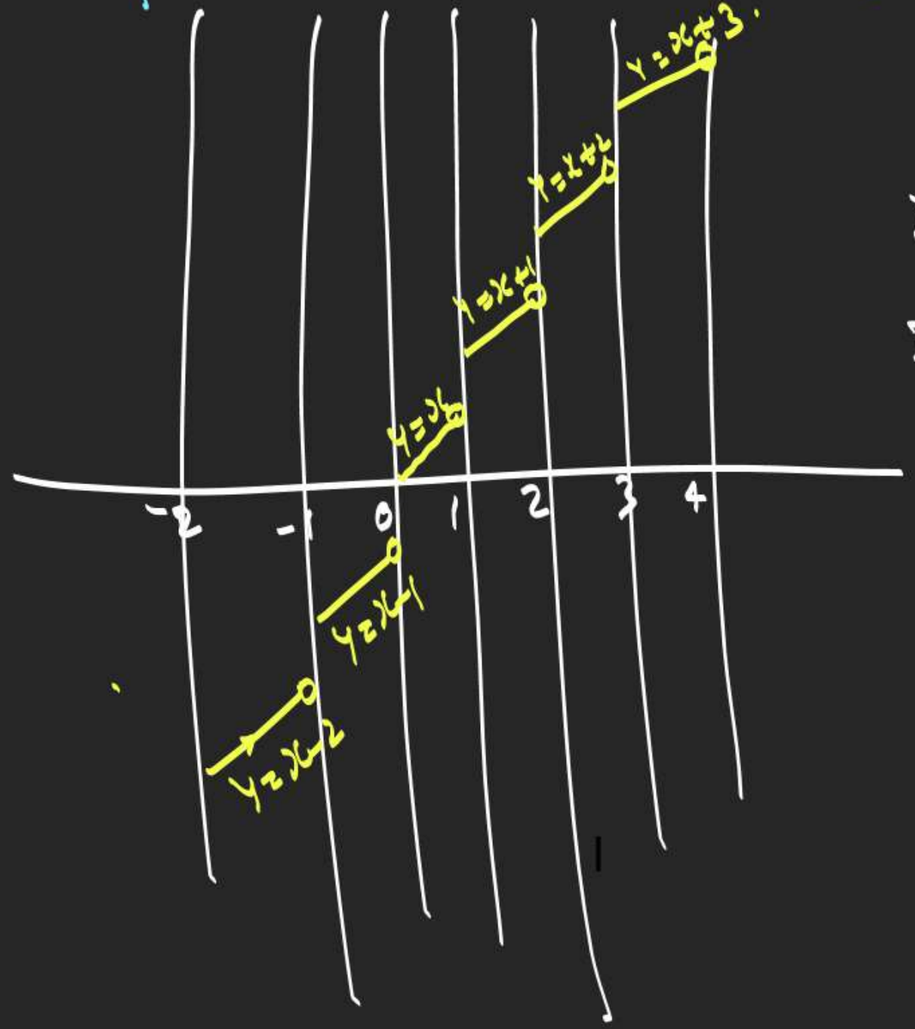
RELATION FUNCTION

Q. $y = x + [x]$ find graph.



[ ] add / sub / div / deg / Prod.
always make Bars and think.

$x \in [0,1) \rightarrow y = x + 0 \Rightarrow y = x$

$x \in [1,2) \rightarrow y = x + 1$

$x \in [2,3) \rightarrow y = x + 2$

Nishant Jindal

RELATION FUNCTION

Q 2 $y = x - [x]$ Make graph?

Kab

$x - [x] \geq 0$

&

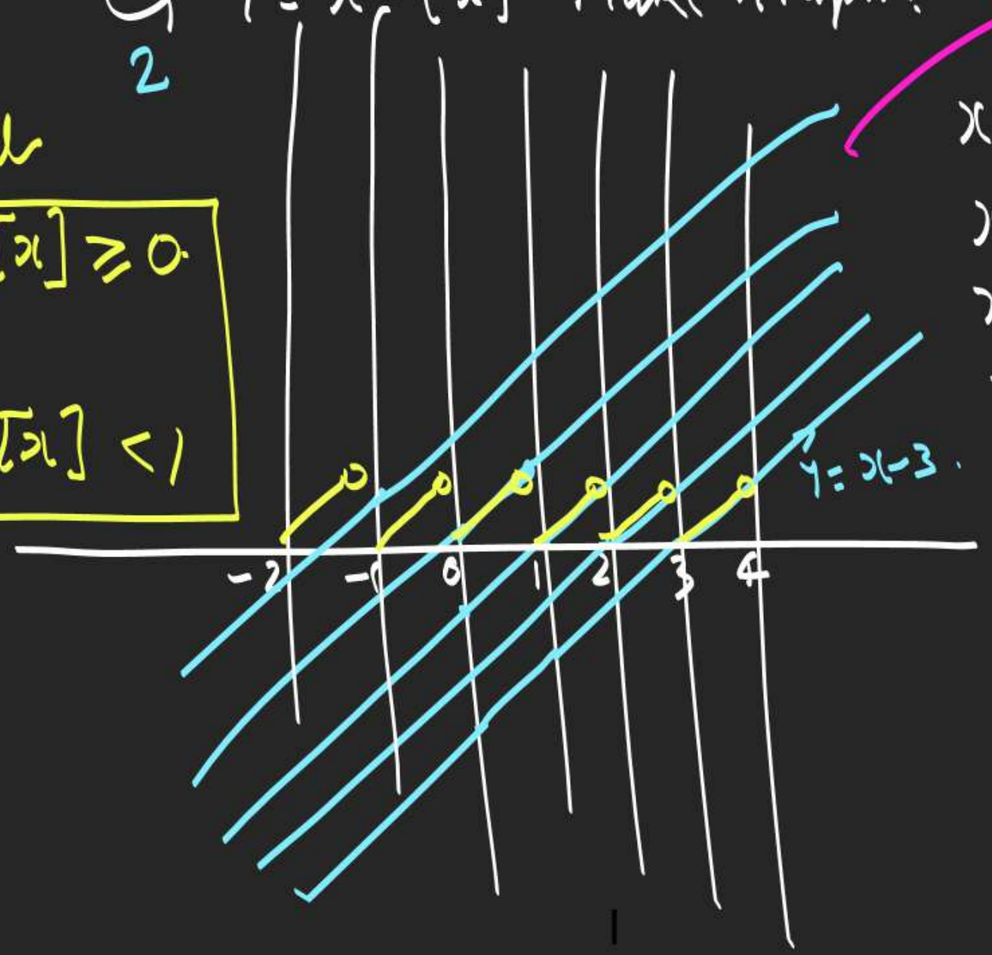
$x - [x] < 1$

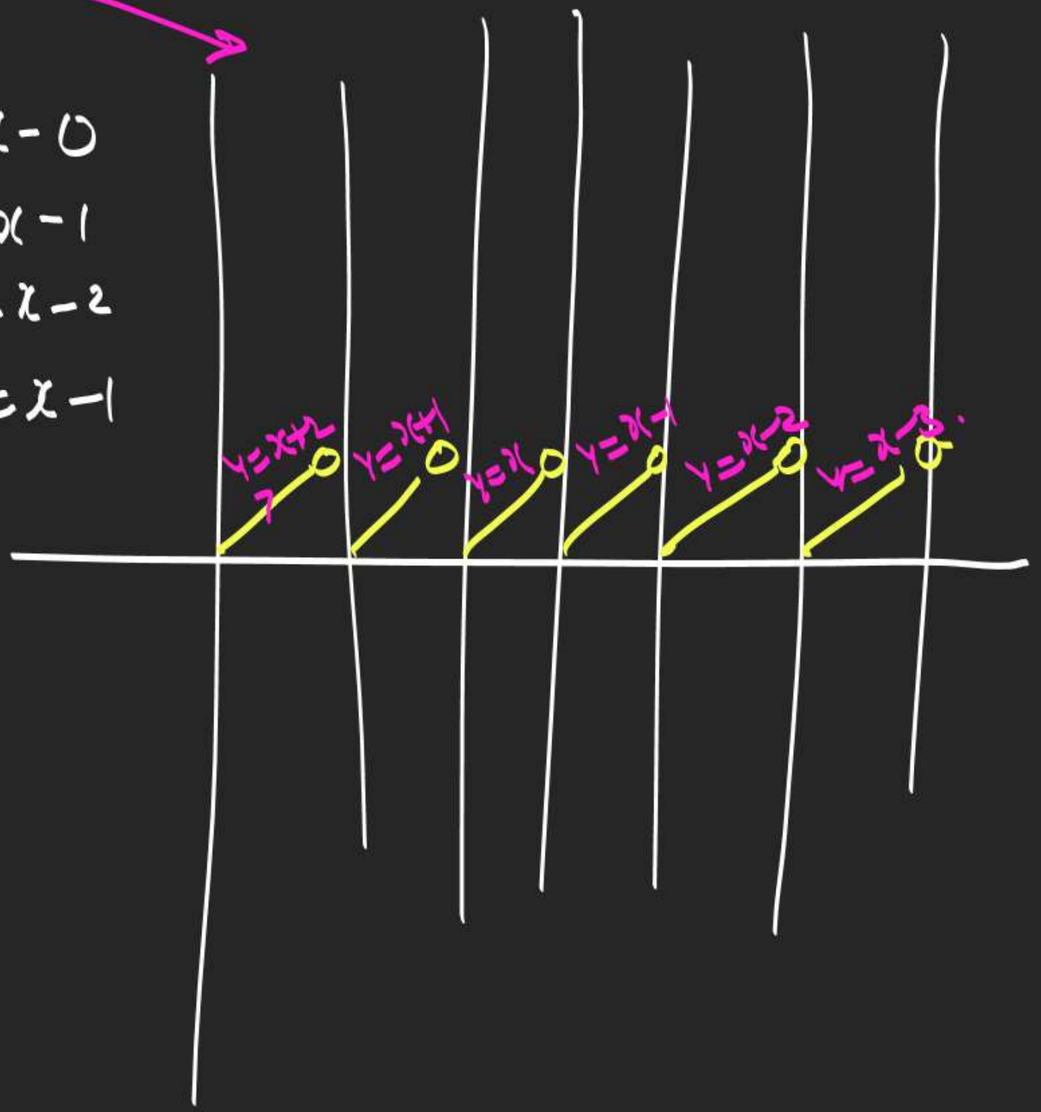
$x \in [0,1) \rightarrow y = x - 0$

$x \in [1,2) \rightarrow y = x - 1$

$x \in [2,3) \rightarrow y = x - 2$

$x \in [-1,0) \rightarrow y = x - 1$





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RELATION FUNCTION

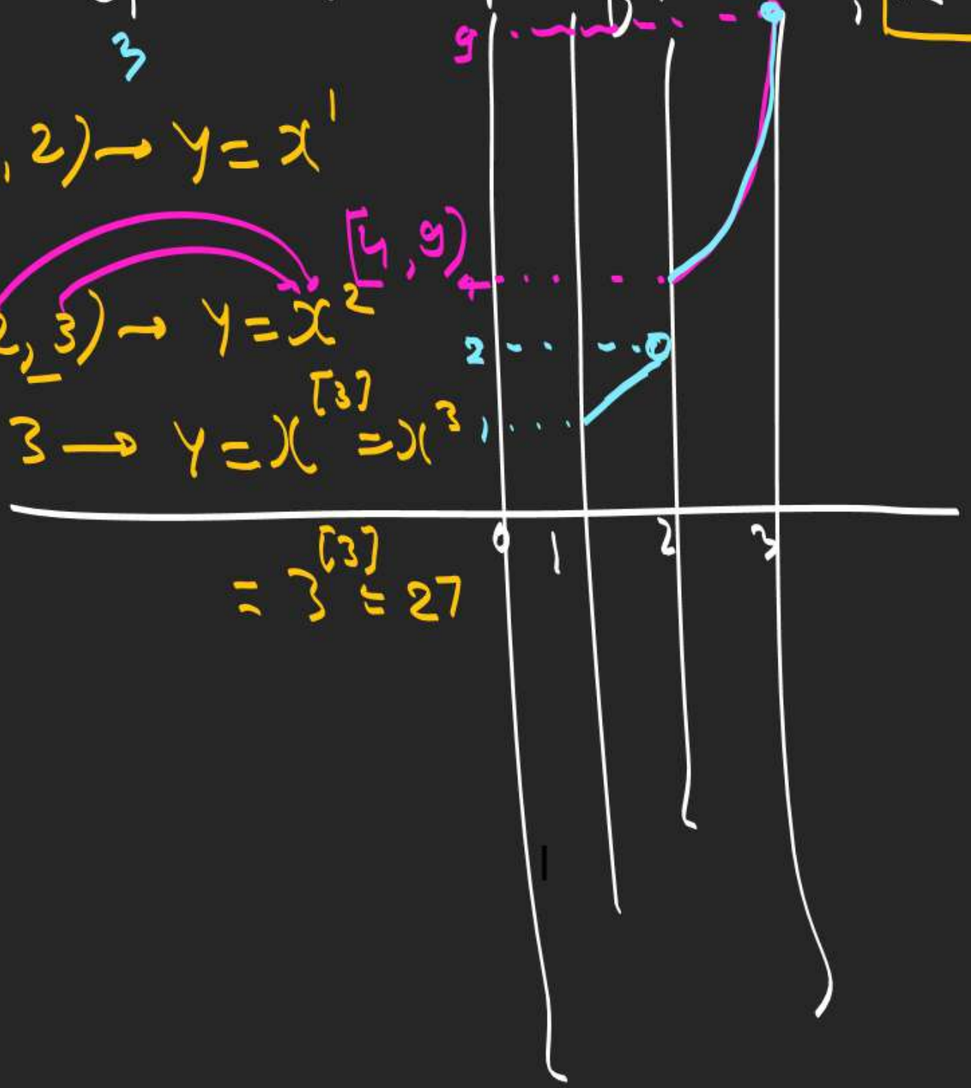
Q 3 Make the graph of $y = x^{[x]}$; $1 \le x \le 3$?

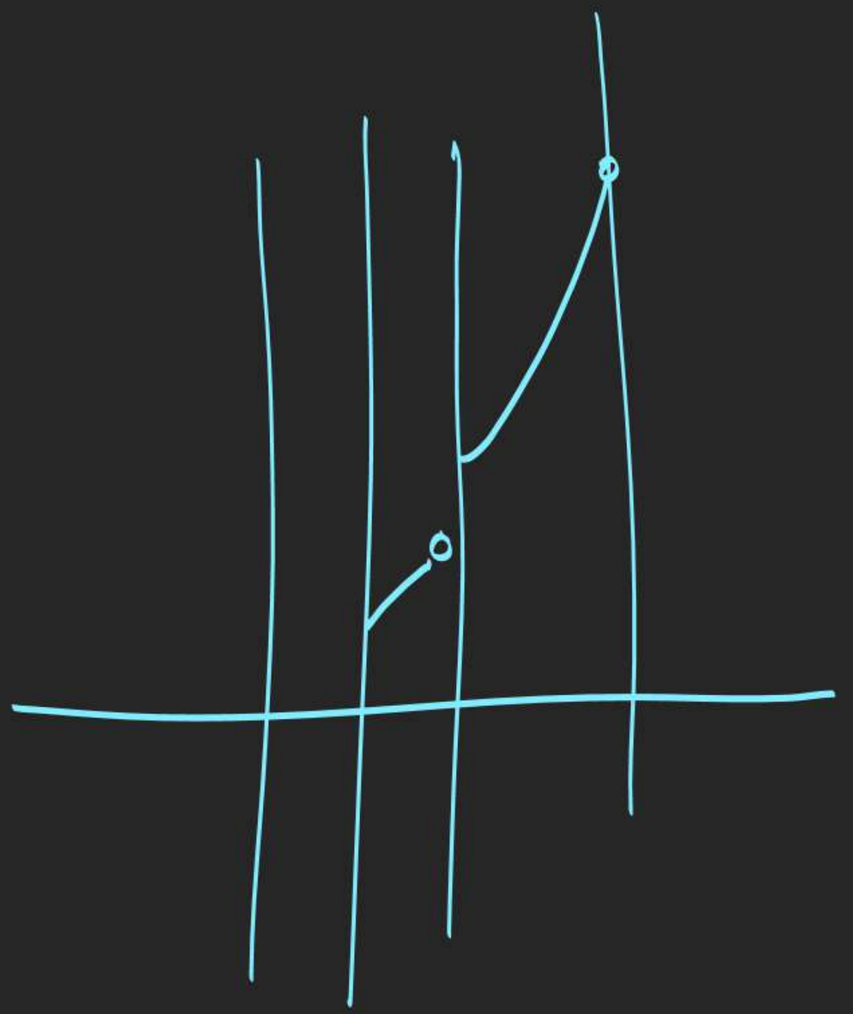
$x \in [1, 2) \rightarrow y = x^1$

$x \in [2, 3) \rightarrow y = x^2$, $[4, 9)$

$x = 3 \rightarrow y = x^{[3]} = x^3$

$= 3^{[3]} = 27$





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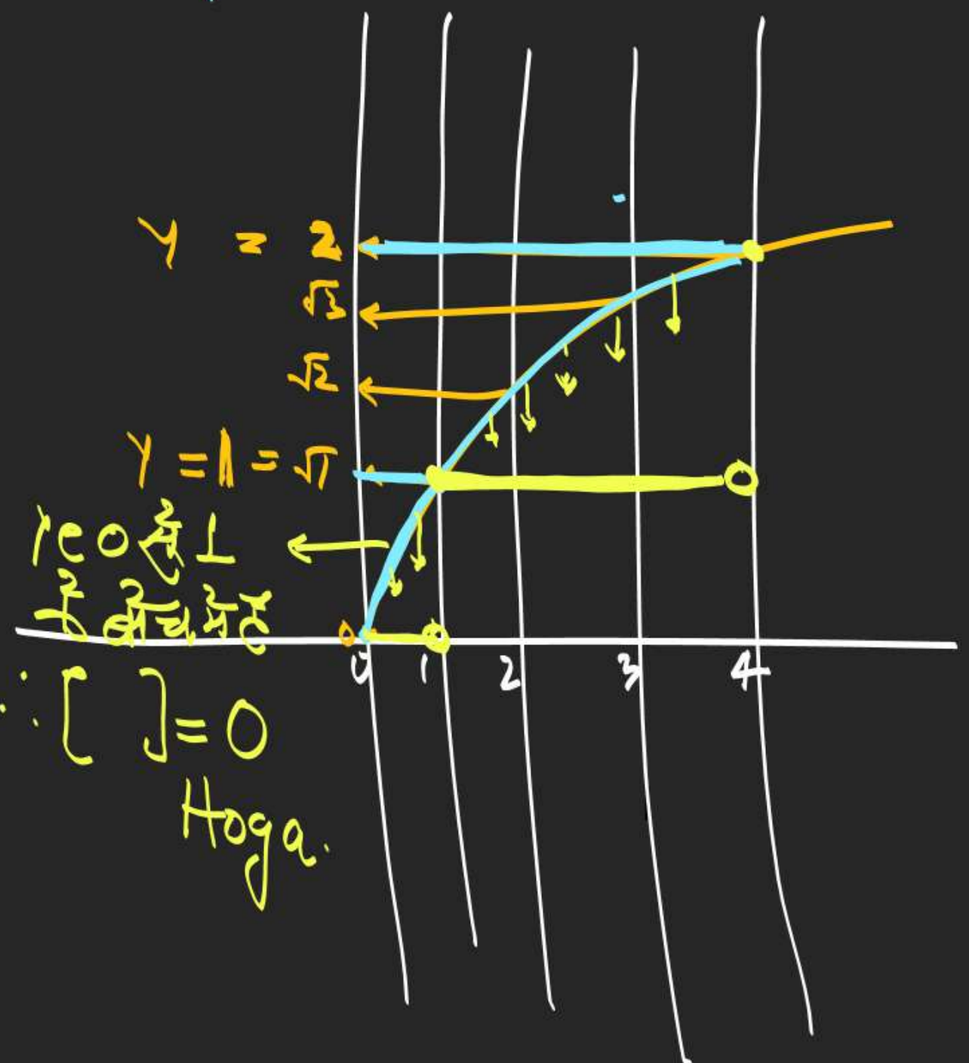
RELATION FUNCTION

Q4 Draw $y=[\sqrt{x}]$; $0 \le x \le 4$?



Yha Par [ ] Kisi me add / Sub / Power / div / Prod. me hai??

No.

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RELATION FUNCTION

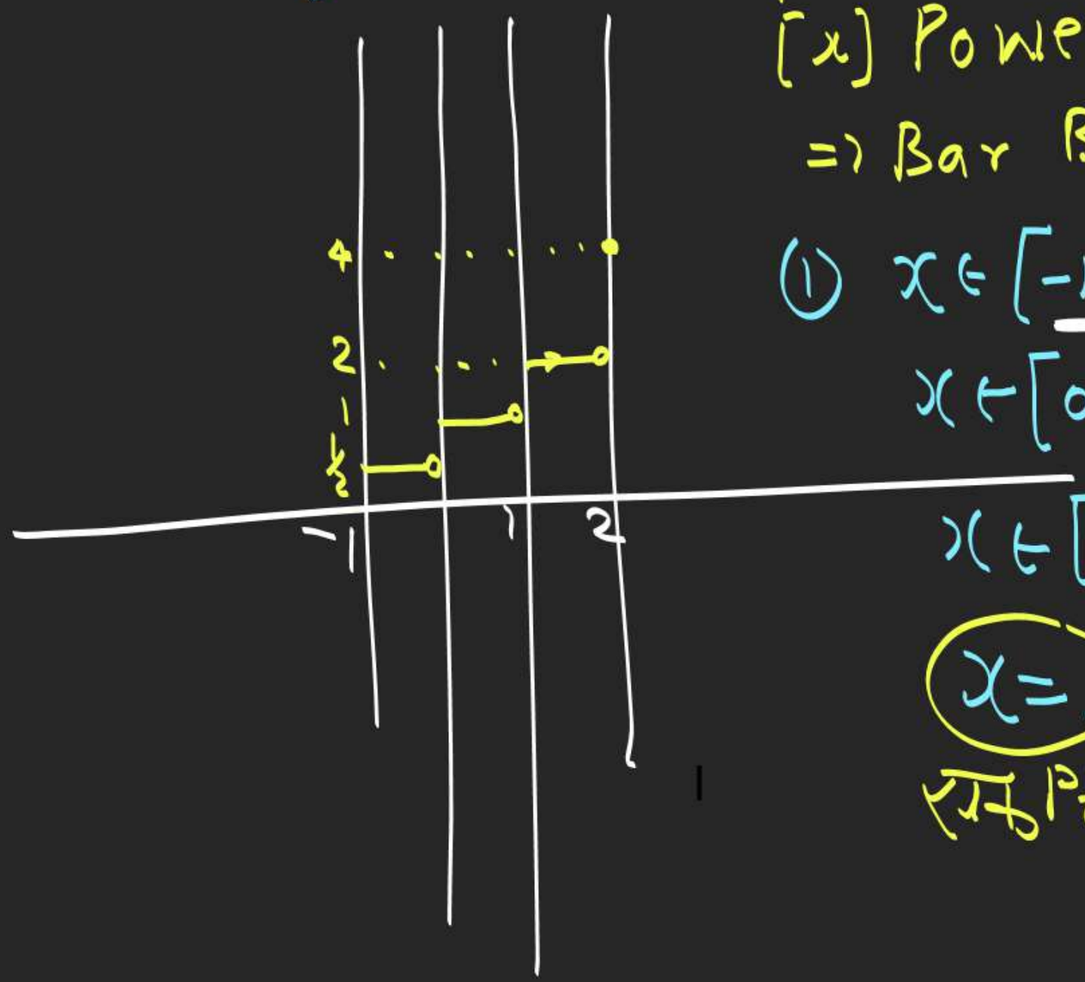
Raees Bachha

Q5 Drain $y = 2^{[x]}$; $-1 \le x \le 2$

$[x]$ Power me hai
⇒ Bar Banegi

$D_f \rightarrow x \in [-1, 2]$

$R_f \Rightarrow y \in \{\frac{1}{2}, 1, 2, 4\}$



① $x \in [-1, 0) \rightarrow y = 2^{-1} = \frac{1}{2}$

$x \in [0, 1) \rightarrow y = 2^0 = 1$ ⟹ $y = 1$

$x \in [1, 2) \rightarrow y = 2^1 = 2$

$x = 2 \rightarrow y = 2^{[2]} = 2^2 = 4$

एक्स्ट्रा Pt.

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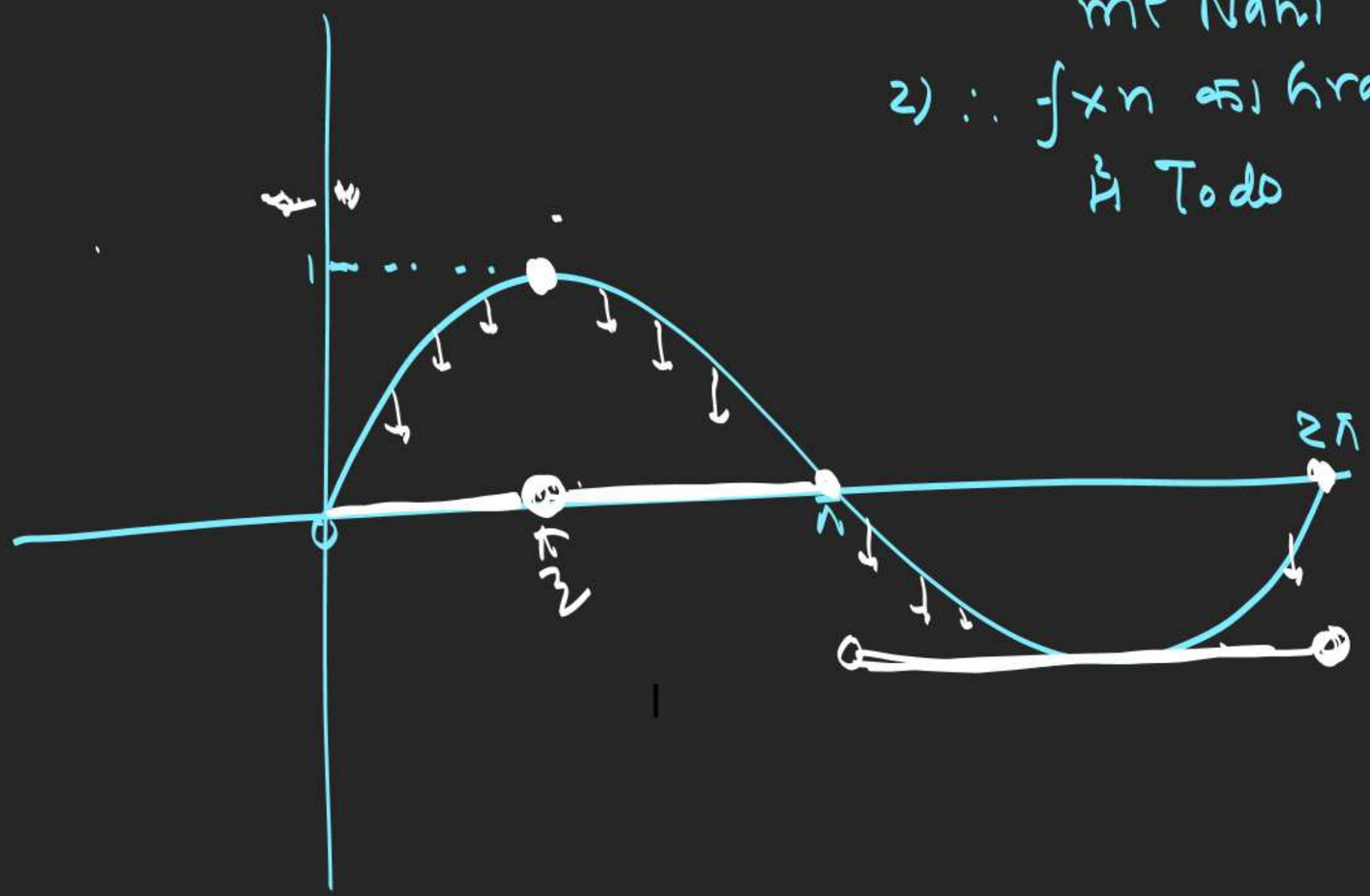
RELATION FUNCTION

Q Draw $y = [\sin x]$ $x \in [0, 2\pi]$

1) [ ] + / − / × / ÷ / Power me Nahi

2) ∴ ∫xn का Graph draw करने then 3rd y के values.

Ki Todo



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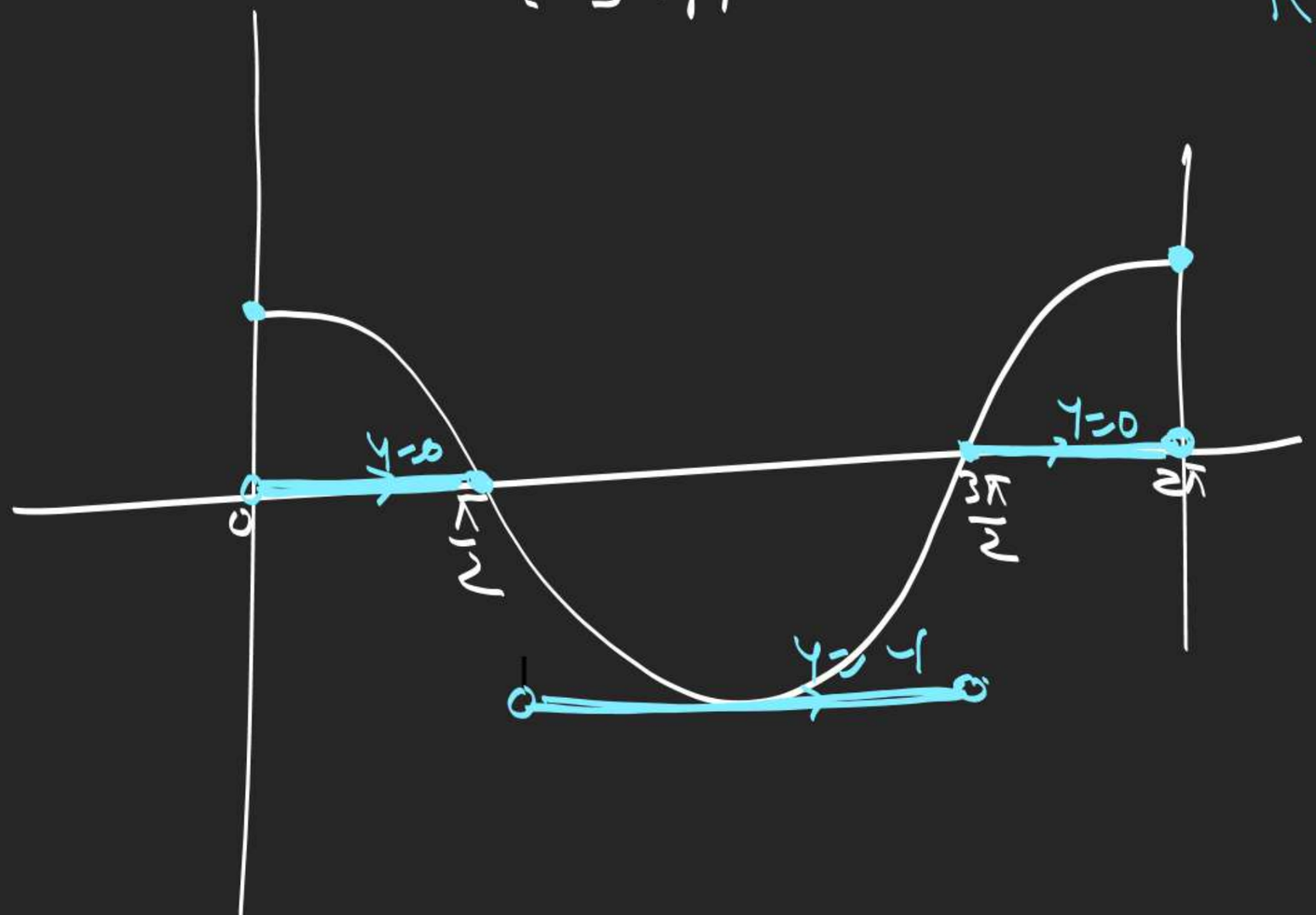
RELATION FUNCTION

Q $y = [\cos x]$; $x \in [0, 2\pi]$

→ [ ] applied.

$D_f \rightarrow 0 \le x \le 2\pi$

$R_f \Rightarrow y = \{1, 0, -1\}$.



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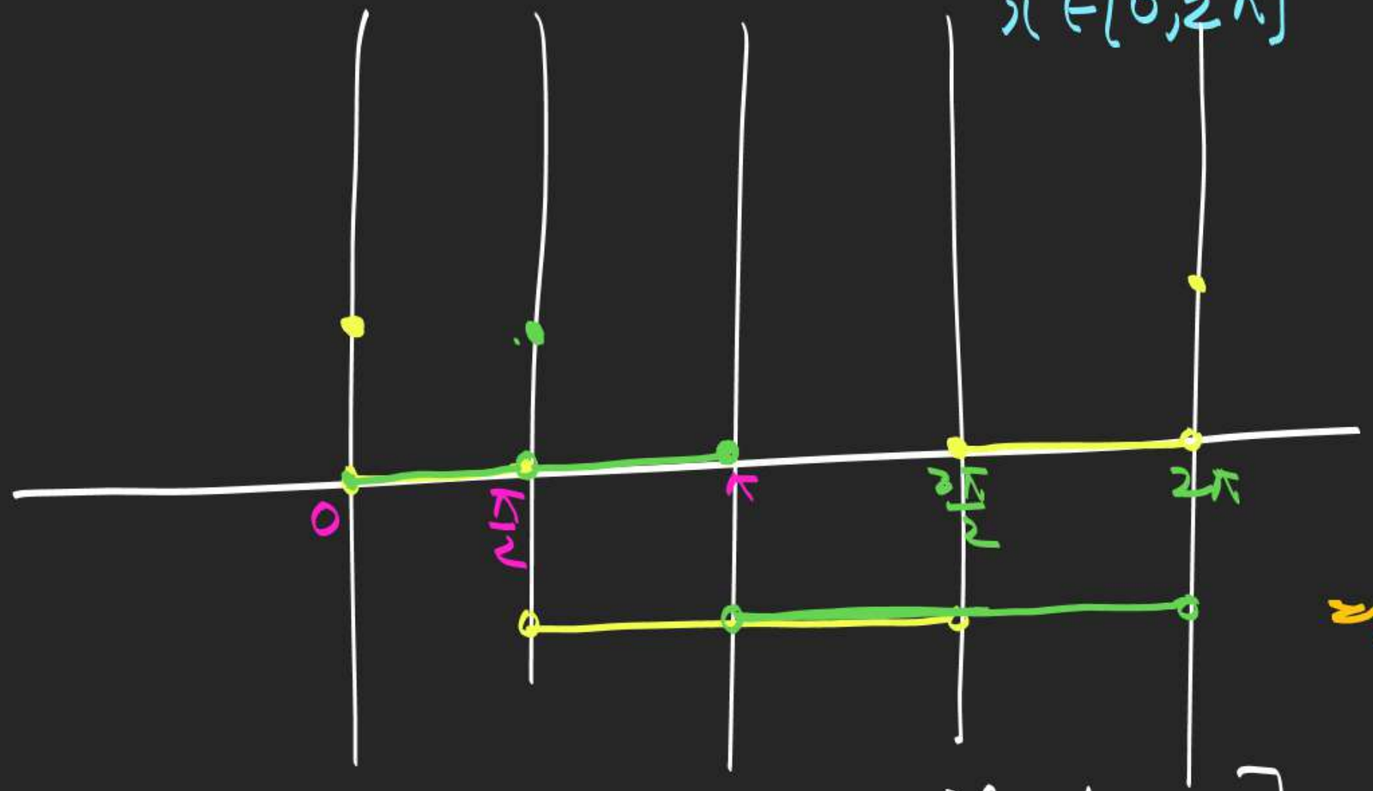
RELATION FUNCTION

Q Draw $y=[\sin x]$ & $y=[\cos x]$ simultaneously

$x \in [0, 2\pi]$



$\Rightarrow$ $[\sin x]$ ka graph is Unchu.

$[\cos x]$ Kahan Kahan?

$x \in (0, \pi] \cup \left(\pi, \frac{3\pi}{2}\right) \Rightarrow x \in \left(0, \frac{3\pi}{2}\right)$

Q find Dom of

$$y = \sqrt{[\sin x] - [\cos x]}$$

$x \in [0, 2\pi]$

$[\sin x] - [\cos x] \geq 0$

$[\sin x] \geq [\cos x]$

Range = Y = Answer = ht

RELATION FUNCTION

Q Range of $f(x)=[\sin x+[\cos x+[\tan x+[\sec x]]]]$ $x\in(0,\frac{\pi}{4})$?

$x\in(0,45^\circ)$

$\sin x\in(0,\frac{1}{\sqrt{2}})$

$\sin x\in(0,.707)$

$[\sin x]=0$

$\cos x\in(\frac{1}{\sqrt{2}},1)$

$\cos x\in(.707,1)$

$\tan x\in(0,1)$

$f(x)=[\sin x]+[\cos x]+[\tan x]+[\sec x]$

$f(x)=0+0+0+1$

$Y=1 \quad \therefore R=\{1\}$

$\sec x\in(1,\sqrt{2})$

$\sec x\in(1,1.414)$

$[\ \ ]=1$

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RELATION FUNCTION

Q $y = 2[x] + 3$ & $y = 3[x-2] + 5$ then $[x+y] = ?$

$y = 3[x] - 6 + 5$

① $y = 2[x] + 3$ & $y = 3[x] - 1$

$3[x] - 1 = 2[x] + 3$

$[x] = 4$

② $y = 2[x] + 3 = 2 \times 4 + 3 = 11$

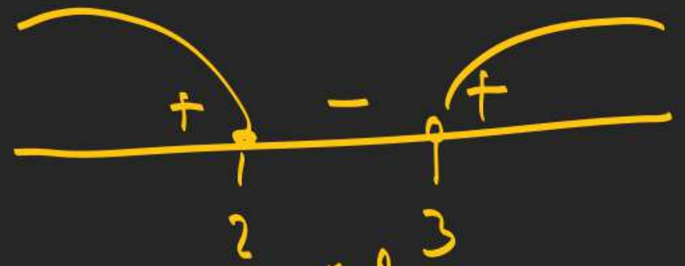
(3) Demand $= [x+y] = [x+11]$

$= [x] + 11 = 4 + 11$

$= 15$

Q Df of $y = \sqrt{\frac{2-[x]}{3-[x]}}$

$\frac{2-[x]}{3-[x]} \geq 0 \Rightarrow \frac{([x]-2)}{([x]-3)} \geq 0$



$[x] \leq 2 \cup [x] > 3$

$x \in (-\infty, 3) \cup [4, \infty)$

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RELATION FUNCTION

Q Find Ramye $y = [\sin x]$

$-1 \le \sin x \le 1$

$[-1] \le [\sin x] \le [1]$

$-1 \le [\sin x] \le 1$

Aisa Int. Jo -1 se 1 tak

$[\sin x] = \{-1, 0, 1\}$

Sahi Answer. Dega.

Q Ramye of $y = [\cos x]$

$-1 \le \cos x \le 1$

$[-1] \le [\cos x] \le [1]$

$-1 \le [\cos x] \le 1$

$[\cos x] = \{-1, 0, 1\}$

3 hi Int.

RELATION FUNCTION

Q Range of $y = [\sin x + \cos x]$

$-\sqrt{2} \le \sin x + \cos x \le \sqrt{2}$

$[-1.41] \le [\sin x + \cos x] \le [1.41]$

$-2 \le [\quad\quad] \le 1$

$[\sin x + \cos x] = \{-2, -1, 0, 1\}$

R_f

Q

$y = a\sin x + b\cos x$ का Range

$-\sqrt{a^2+b^2} \le a\sin x + b\cos x \le \sqrt{a^2+b^2}$

$y = \sin x + \cos x$

$-\sqrt{1^2+1^2} \le \sin x + \cos x \le \sqrt{1^2+1^2}$

$-\sqrt{2} \le \quad\quad \le \sqrt{2}$

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RELATION FUNCTION

Q $f(x) = [1+\sin x] + [2+\sin\frac{x}{2}] + [3+\sin\frac{x}{3}] + \cdots + [n+\sin\frac{x}{n}]$; $x \in (0,\pi)$

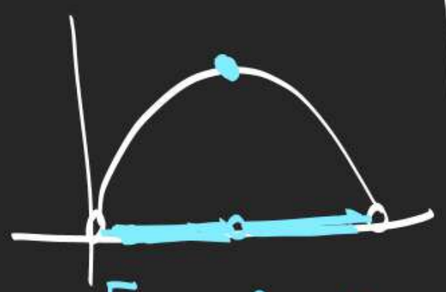
Find Range?

$= (1+2+3+4+\cdots+n) + [\sin x] + [\sin\frac{x}{2}] + [\sin\frac{x}{3}] + \cdots [\sin\frac{x}{n}]$

$= \frac{(n)(n+1)}{2} + \{0,1\} + \{0\} + \{0\} + \cdots + \{0\}$

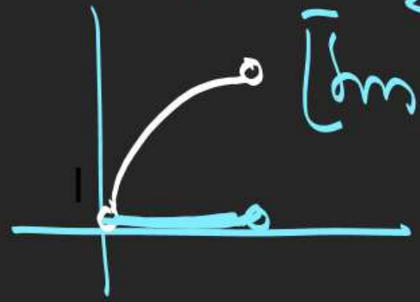
$= \left\{\frac{(n)(n+1)}{2}, \frac{(n)(n+1)}{2}+1\right\}$.

$x \in (0,\pi)$



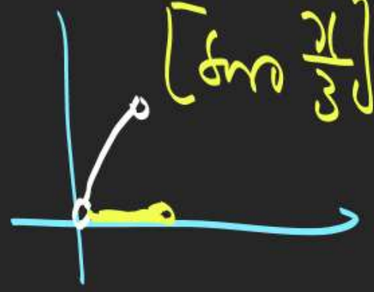
$[\sin x] = \{1,0\}$

$x \in (0,\pi) \Rightarrow \frac{x}{2} \in (0,\frac{\pi}{2})$



$[\sin\frac{x}{2}] = \{0\}$

$\frac{x}{3} \in (0,\frac{\pi}{3})$



$[\sin\frac{x}{3}] = \{0\}$

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RELATION FUNCTION

Q If $0 < x < 300$ & $\left[\frac{x}{2}\right] + \left[\frac{x}{5}\right] + \left[\frac{x}{10}\right] = \frac{4x}{5}$ then Sum of all PSBL values of x is m find $\left[\frac{m}{1000}\right] = ?$

$\left[\frac{4350}{1000}\right] = [4.35] = 4$

$[7] = 7$

$[16) = 16$

$\frac{30}{2}, \frac{30}{5}, \frac{30}{10}$

15, 6, 3

Interesting → $\frac{x}{2} + \frac{x}{5} + \frac{x}{10} = \frac{5x+2x+x}{10} = \frac{8x}{10} = \frac{4x}{5}$

Iska matlab ye [ ] me the hi nahi

$\Rightarrow \frac{x}{2} = I$ & $\frac{x}{5} = I$ & $\frac{x}{10} = I$

$x = 10, 20, 30, 40, \ldots 290$

$\therefore Sum = m = 10 + 20 + 30 + \ldots + 290 = 10(1 + 2 + \ldots 29)$

$= 10 \times \frac{29 \times (30)}{2} = 150 \times 29 = 4350$

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RELATION FUNCTION

10) Fractional Part fxn.

A) It is shown $f(x) = \{x\}$

B) It gives After decimal value.

$\{2.36\} = .36$

$\{4.01\} = .01$

$\{4\} = 0$

$\{-13\} = 0$

$\{-4.12\} = 1 - .12$

$= .88$

$\{-238.39\} = 1 - .39$

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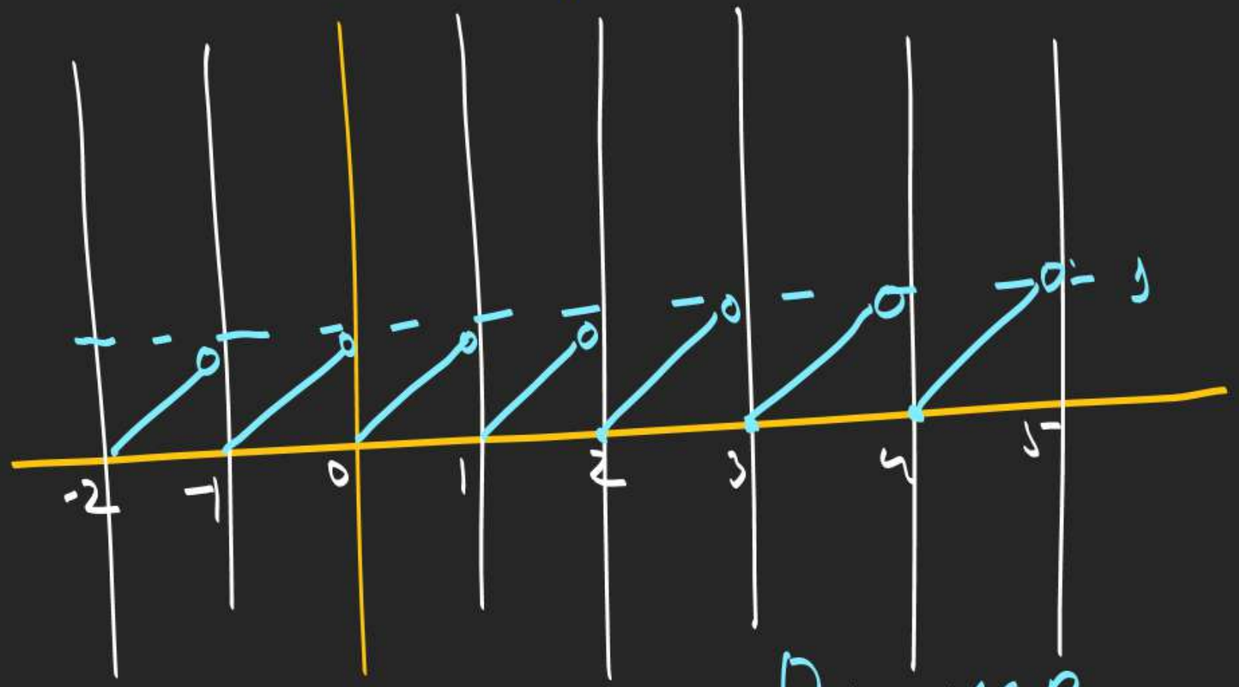
RELATION FUNCTION

(1) Graph of $y = \{x\}$



$D_f \rightarrow x \in R$

$R_f \rightarrow y \in [0, 1)$

Properties.

1) $0 \leq \{x\} < 1$

$0 \leq \{\text{Anything}\} < 1$

2) $\{x\} \geq 0$

3) $\{\text{Int}\} = 0$

4) If $\{x\} = 0 \Rightarrow x = \text{Integer}$