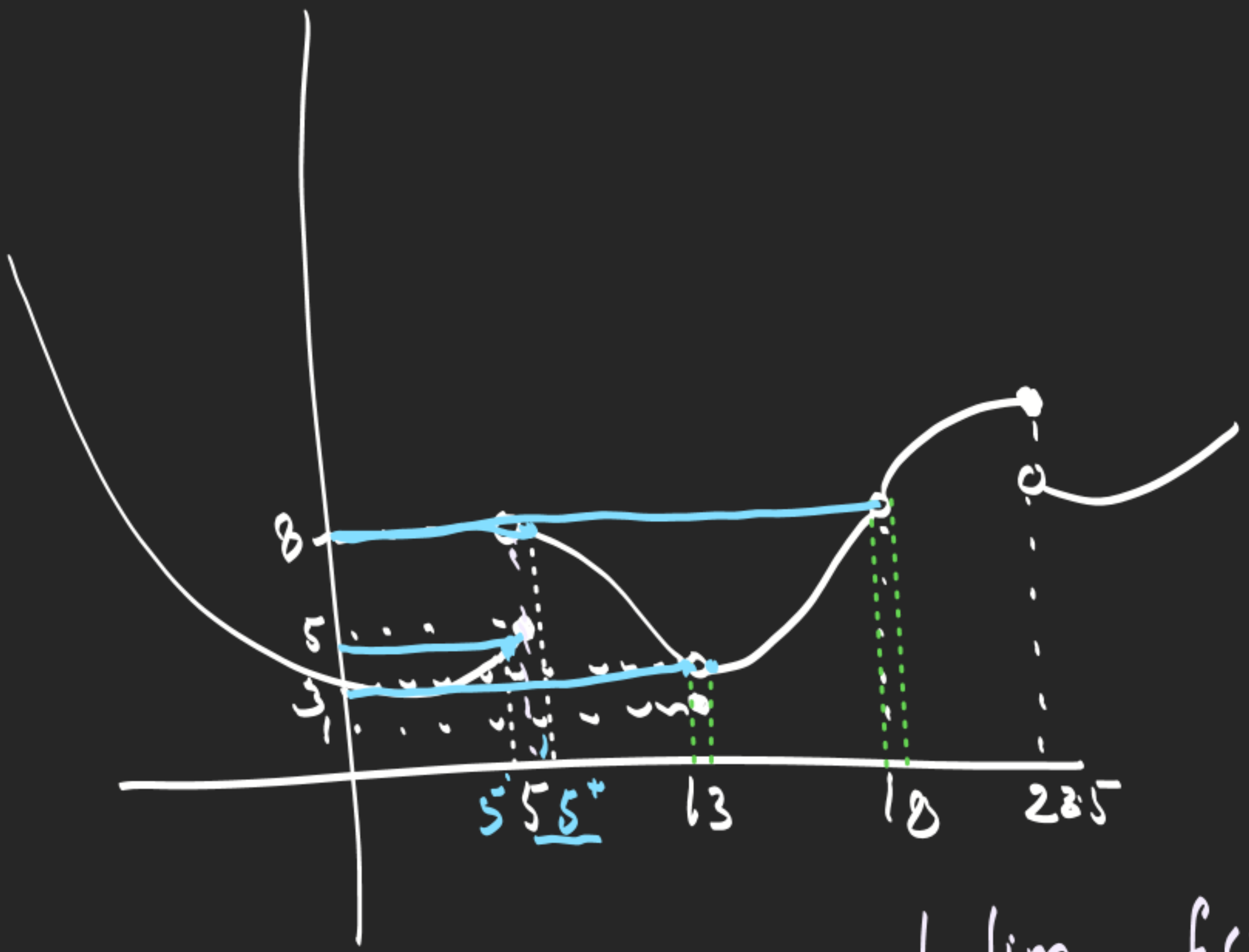
Nishant Jindal

LIMIT



LHL ≠ RHL at $x=5$

Limit Does not Exist.

LDNE

$\lim_{x\to 5} f(x) = ?$

$x \neq 5$

$\lim_{x\to 5^-} f(x) = 5 = LHL$

$\lim_{x\to 5^+} f(x) = 8 = RHL$

(B) $\lim_{x\to 13} f(x)$

$x \neq 13$

LHL

RHL

$\lim_{x\to 13^-} f(x) = 3$

$\lim_{x\to 13^+} f(x) = 3$

$\therefore \boxed{\lim_{x\to 13} f(x) = 3}$

(C) $\lim_{x\to 18} f(x) = \boxed{8}$

LHL $= 8$

RHL $= 8$

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LIMIT

Q $\lim_{x\to 0} e^{\frac{1}{x}} \rightarrow$ Chor fxn $\rightarrow$ LHL, RHL

Check Krna Padega.

LHL

$\lim_{x\to 0^-} e^{\frac{1}{x}}$ $\boxed{x = 0-h}$

$\lim_{h\to 0} e^{-\frac{1}{h}} = e^{-\infty}$

$\frac{1}{e^{\infty}} = \frac{1}{\infty}$

$= 0$

RHL

$\lim_{x\to 0^+} e^{\frac{1}{x}}$ $\boxed{x = 0+h}$

$\lim_{h\to 0} e^{\frac{1}{h}}$

$= e^{\infty}$

$(2.7)^{\infty} \rightarrow \infty$

LHL $\neq$ RHL

L.DNE

Q $\lim_{x\to a} \frac{1}{(x-a)^{2n+1}} \longrightarrow \frac{1}{(x)^{odd}}$ = Chor fxn

LHL / RHL

LHL $\boxed{x = a-h}$

$\lim_{x\to a^-} \frac{1}{(x-a)^{2n+1}}$

$\lim_{h\to 0} \frac{1}{(\cancel{a}-h-\cancel{a})^{2n+1}}$

$- \frac{1}{(h)^{2n+1}}$

$= -\infty$

RHL $\boxed{x = a+h}$

$\lim_{x\to a^+} \frac{1}{(x-a)^{2n+1}}$

$\lim_{h\to 0} \frac{1}{(\cancel{a}+h-\cancel{a})^{2n+1}}$

$\frac{1}{(h)^{2n+1}} = \infty$

LHL $\neq$ RHL

L DNE

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LIMIT

Q $\lim_{x\to 0}\left(1+2^{\frac{1}{x}}\right)^{-1} = ?$

LHL ≠ RHL

L DNE

$\lim_{x\to 0}\frac{1}{1+2^{1/x}}$ → Char fxn

LHL $\boxed{x=0-h}$

$\lim_{x\to 0^-}\frac{1}{1+2^{1/x}}$

$\lim_{h\to 0}\frac{1}{1+2^{\frac{1}{-h}}}$

$\frac{1}{1+2^{-\infty}}$

$\frac{1}{1+0} = 1$

RHL $\boxed{x=0+h}$

$\lim_{x\to 0^+}\frac{1}{1+2^{1/x}}$

$\lim_{h\to 0}\frac{1}{1+2^{\frac{1}{h}}}$

$\frac{1}{1+2^{\infty}}$

$\frac{1}{\infty} = 0$

$(2)^{\infty} = (1+Bde)^{\infty} \to \infty$

$2^{-\infty} = \frac{1}{2^{\infty}} = \frac{1}{\infty} = 0$

Q $\lim_{\boxed{x\to 0^+}}\frac{xe^{\frac{1}{x}}}{1+e^{1/x}}$ $x=0+h$

1) Demand - RHL only

$\lim_{h\to 0}\frac{h\cdot e^{\frac{1}{h}}}{1+e^{1/h}} = \lim_{h\to 0}\frac{\cancel{e^{1/h}}\cdot h}{\cancel{e^{1/h}}\left(\frac{1}{e^{1/h}}+1\right)}$

$= \frac{0}{\frac{1}{\infty}+1} = \frac{0}{0+1} = 0$

1) When fxn has $e^{1/x}$ in Nr & Dr Both then take Comm.

2) When fxn has $e^{-1/x}$ in Nr & Dr both Never take $e^{-1/x}$ Comm.

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LIMIT

Q $\lim_{x\to 0} \dfrac{(1+a^3)+8e^{1/x}}{1+(1-b^3)e^{1/x}} = 2$ find (a,b)?

$1/x \to$ char fxn.

LHL $\boxed{x=0-h}$

$$\lim_{h\to 0} \frac{(1+a^3)+8e^{-\frac{1}{h}}}{1+(1-b^3)e^{-1/h}} = 2$$

$e^{\infty} \to \infty$

$e^{-\infty} = 0$

$$\frac{(1+a^3)+\cancel{8e^{-\infty}}}{1+\cancel{(1-b^3)e^{-\infty}}} = 2$$

$$\frac{(1+a^3)}{1} = 2 \Rightarrow 1+a^3 = 2$$

$a^3 = 1$

$(a=1)$ //

RHL $\boxed{x=0+h}$

$$\lim_{h\to 0} \frac{(1+a^3)+8e^{\frac{1}{h}}}{1+(1-b^3)e^{\frac{1}{h}}} = 2$$

$$\lim_{h\to 0} \frac{\cancel{e^{1/h}}\left\{\cancel{\frac{1+a^3}{e^{1/h}}}+8\right\}}{\cancel{e^{1/h}}\left\{\cancel{\frac{1}{e^{1/h}}}+(1-b^3)\right\}} = 2$$

$$\Rightarrow \frac{\cancel{8}\,4}{1-b^3} = \cancel{2}$$

$4 = 1-b^3 \Rightarrow b^3 = -3 \Rightarrow b = (-3)^{1/3}$

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LIMIT

Q $\lim_{x\to 0} \frac{x}{|x|+x^2}$

Mod Aakarshit Kar Rha hai!!

LHL

$x = 0 - h$

$\lim_{h\to 0} \frac{-h}{|-h|+(-h)^2}$

$\lim_{h\to 0} \frac{-h}{h+h^2}$

$\lim_{h\to 0} \frac{-\cancel{h}}{\cancel{h}(1+h)}$

$\frac{-1}{1+0} = -1$

RHL

$x = 0 + h$

$\lim_{h\to 0} \frac{h}{|h|+h^2}$

$\lim_{h\to 0} \frac{h}{h+h^2}$

$\lim_{h\to 0} \frac{\cancel{h}\,1}{\cancel{h}(1+h)}$

$\frac{1}{1+0} = 1$

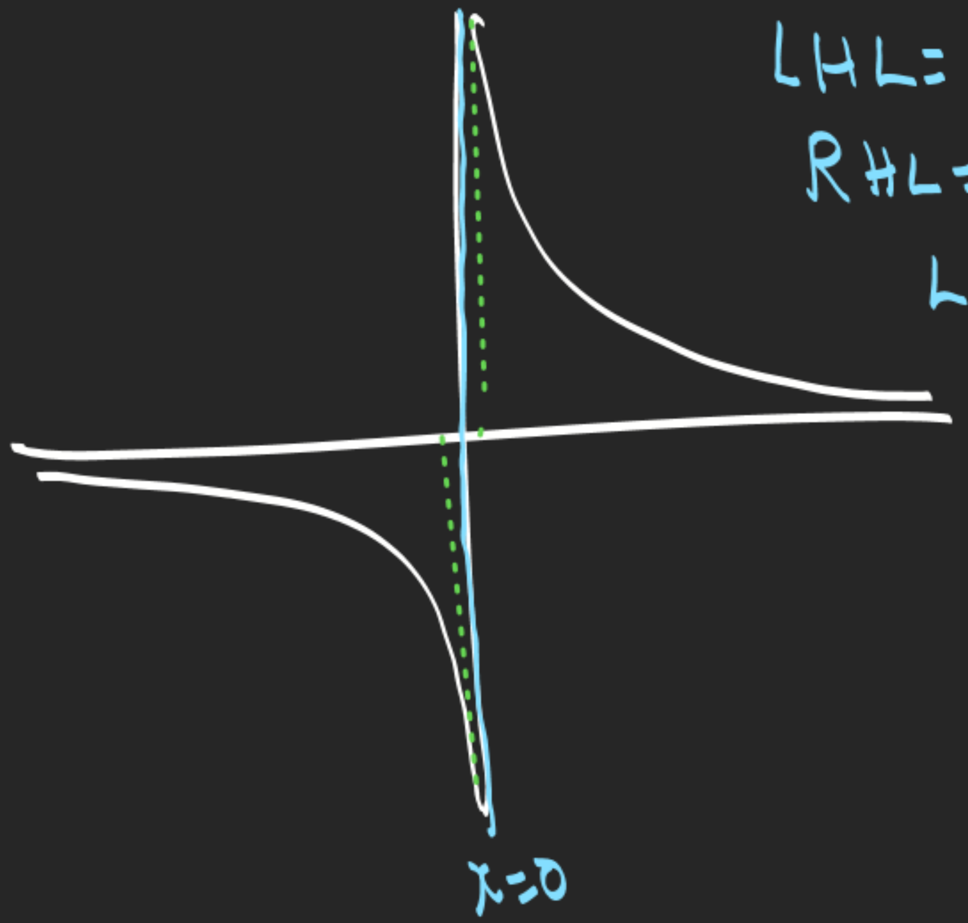
LHL $\neq$ RHL

LDNE

Q

LHL & RHL value at $x=0$

for $f(x) = \frac{1}{x}$



LHL $= -\infty$

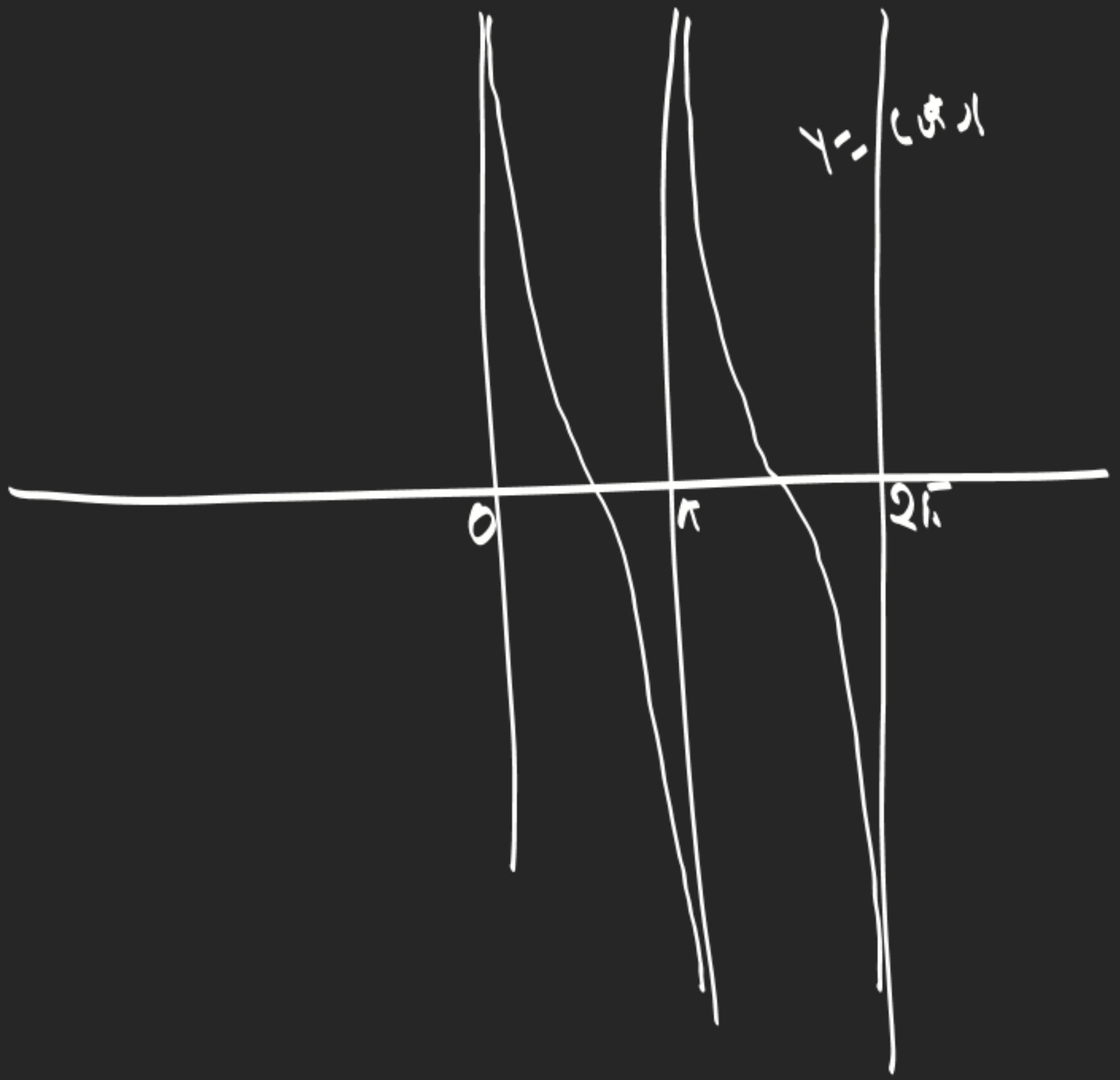
RHL $= +\infty$

LDNE

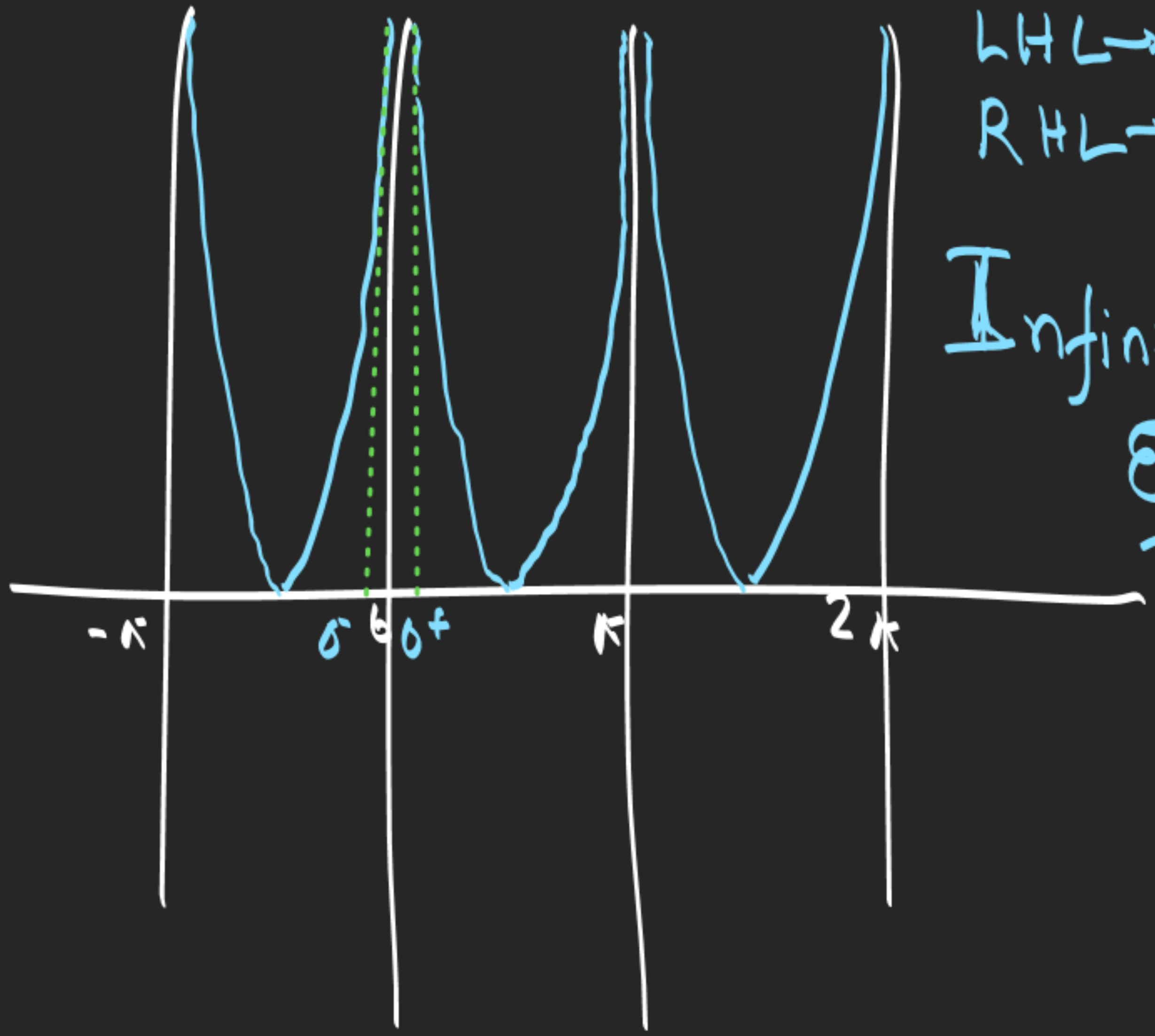
Nishant Jindal

LIMIT

Q LHL & RHL for $f(x) = |\cot x|$ at $x = 0$



$y = |\cot x|$



LHL $\to \infty$

RHL $\to \infty$

Infinite Limit Exist

Nishant Jindal

LIMIT

Q $\lim_{x\to 11} (-1)^{[x]} \to [\;] \to$ Aakasharn

$= ?$

10 11

LHL

$x = 11 - h$

$\lim_{h\to 0} (-1)^{[11-h]}$

$\lim_{h\to 0} (-1)^{10} = +1$

RHL

$x = 11 + h$

$\lim_{h\to 0} (-1)^{[11+h]}$

$\lim_{h\to 0} (-1)^{11} = -1$

LDNE

Q $\lim_{x\to\infty} (-1)^{[x]}$

LHL $x = \infty - h \to \infty$

RHL $x = \infty + h \to \infty$

Nonsense

$(-1)^{odd} = -1$

$(-1)^{Even} = +1$

LDNE

Multiple answer not allowed

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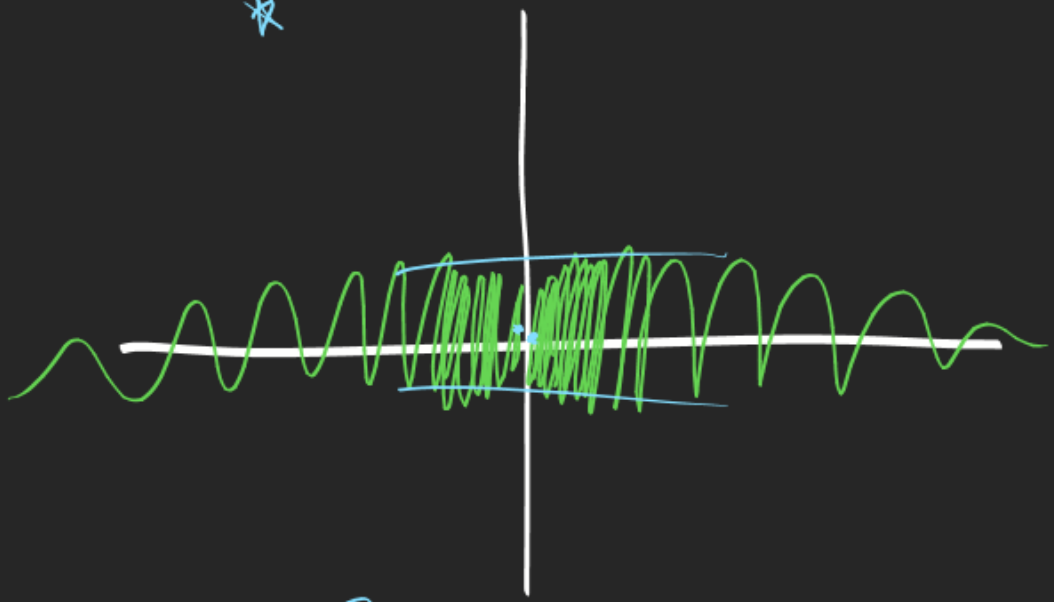
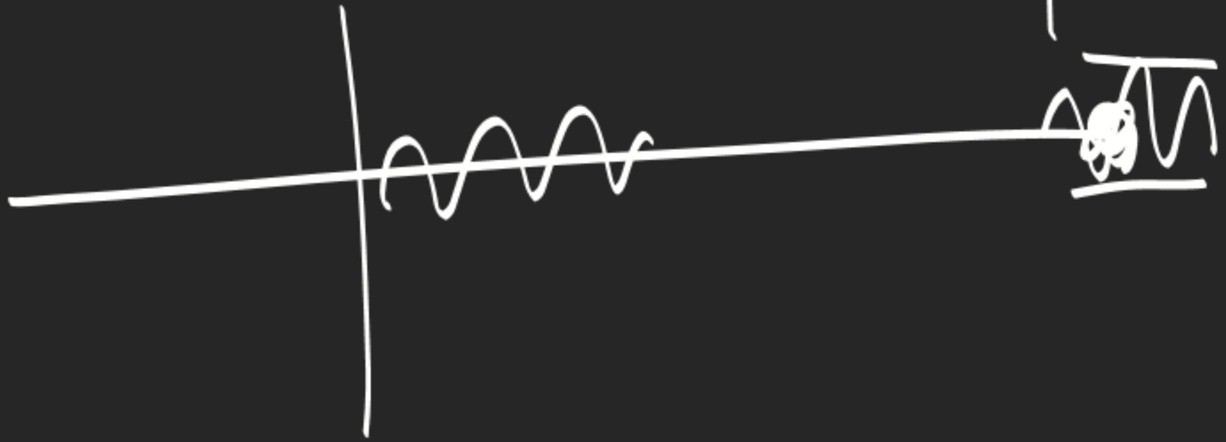
LIMIT

$\lim_{x \to 0} \sin\frac{1}{x}$ = LDNE



$\sin(\infty)$ = Any value betn -1 to $+1$

$\cos(\infty)$ = ______ betn -1 to $+1$



Q $\lim_{x \to 0} \frac{[x^2]}{x^2}$ → Char fxn. $= 0$

LHL

$x = 0 - h$

$\frac{[(-h)^2]}{(-h)^2}$

$\lim_{h \to 0} \frac{[h^2]}{h^2}$ → 0 Bda

$\lim_{h \to 0} \frac{0}{h^2} = 0$

RHL

$x = 0 + h$

$\frac{[h^2]}{h^2}$

$\lim_{h \to 0} \frac{[h^2]}{h^2}$

$\lim_{h \to 0} \frac{0}{h^2} = 0$