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≥ 90 ✓

$\boxed{M \geq 80}$

$+5$ $\sum \left[\frac{a+b}{c}\right] = \sum \frac{a+b}{c} - \left\{\frac{a+b}{c}\right\}$

$\underbrace{\left\{\frac{a+b}{c}\right\}}_{<3}$

50+

+10

$\boxed{\geq 50\%}$ ✓

$< \underline{50}$

$> 6 - (1+1+1)$

$= 3$

$\boxed{=4}$

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$P(1) = 10$

$2 \quad 20$

$3 \quad 30$

$P(x)$

$$P(x) - 10x = (x-1)(x-2)(x-3)(x-\alpha)$$

$$\frac{\left(120 + 11 \times 10 \times 9 \times (12-\alpha)\right) + \left(-80 + (-9)(-10)(-11)(-8-\alpha)\right)}{10}$$

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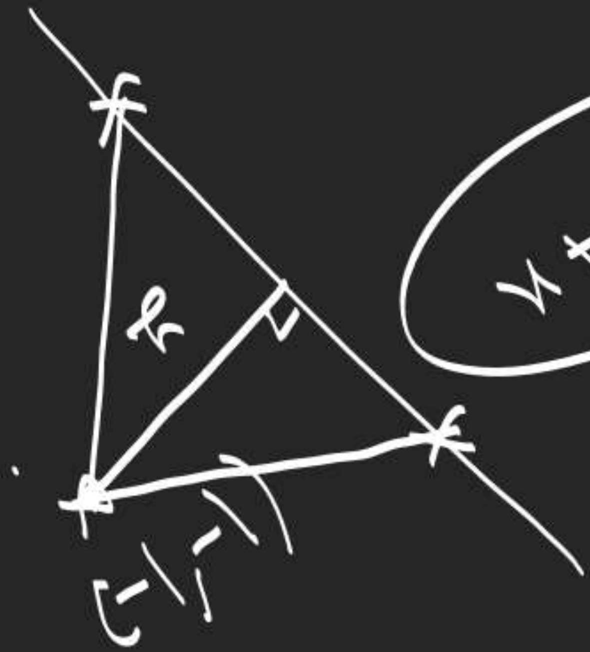
$$x^3+3xy+y^3=1$$

$$x^3+y^3+(-1)^3 = 3xy(-1)$$

$x+y-1=0$ or $x=y=-1$

$$a^3+b^3+c^3-3abc=(a+b+c)(a^2+b^2+c^2-ab-bc-ca)$$

$$=(a+b+c)\frac{1}{2}\left((a-b)^2+(b-c)^2+(c-a)^2\right)$$



$x+y=1$

$$\Delta=\frac{p^2}{\sqrt{3}}=\left(\frac{3}{\sqrt{2}}\right)^2\frac{1}{\sqrt{3}}=$$

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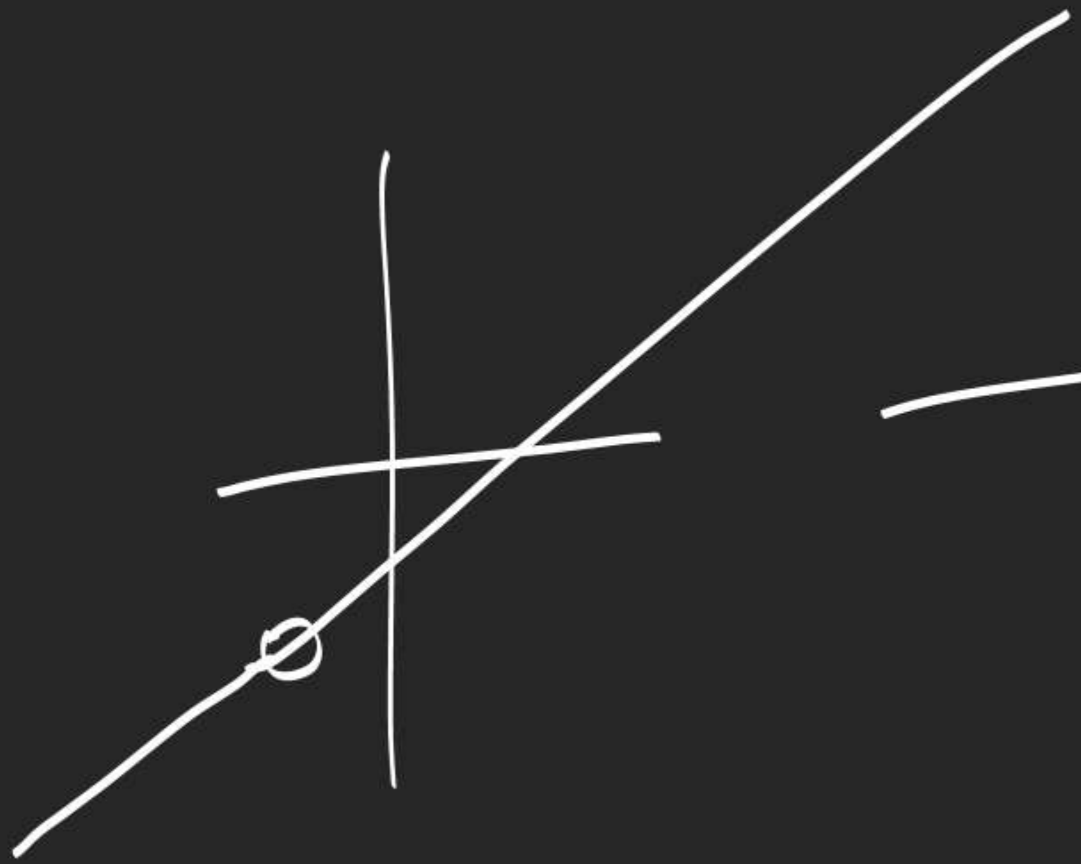
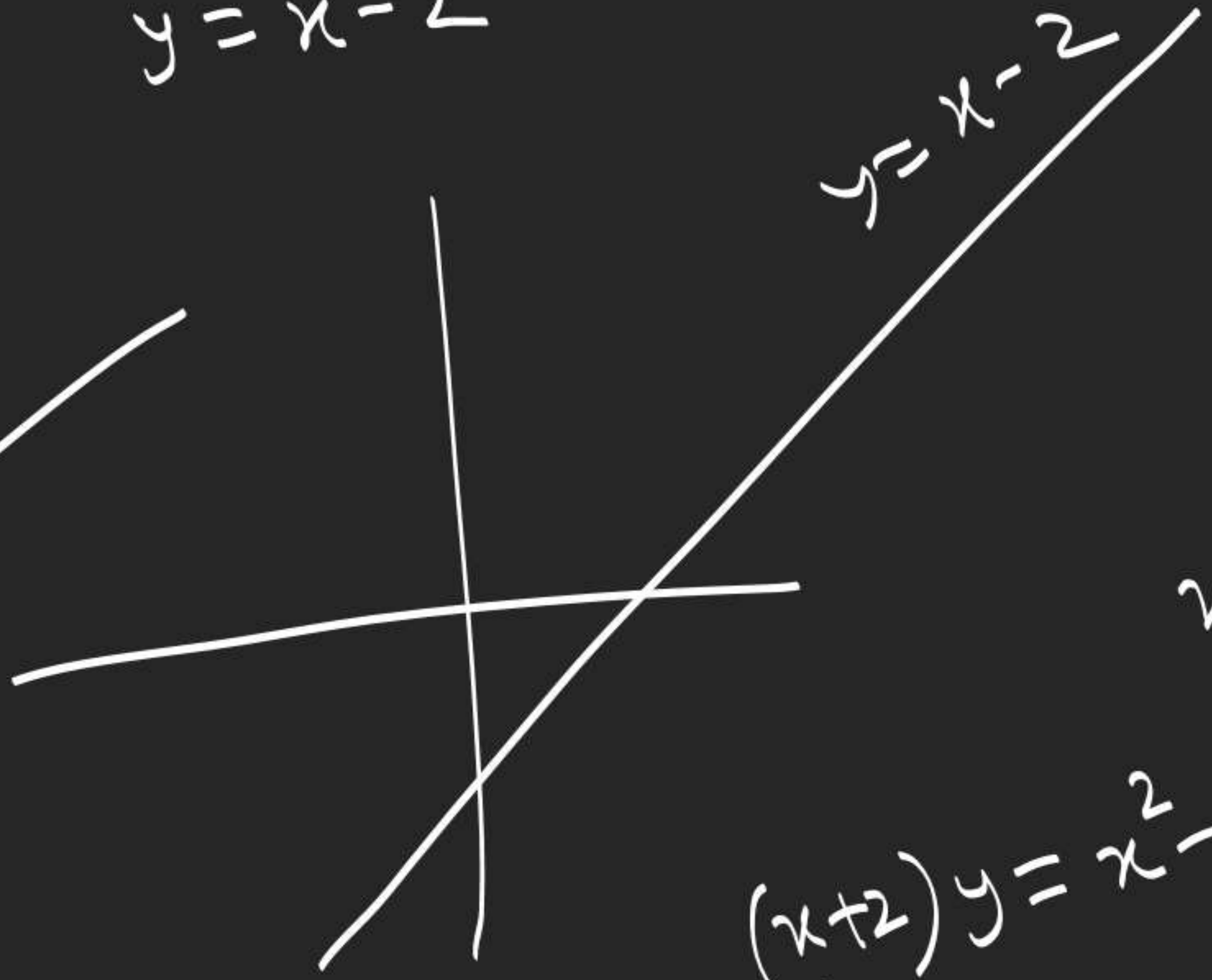
19.

$y = x - 2$



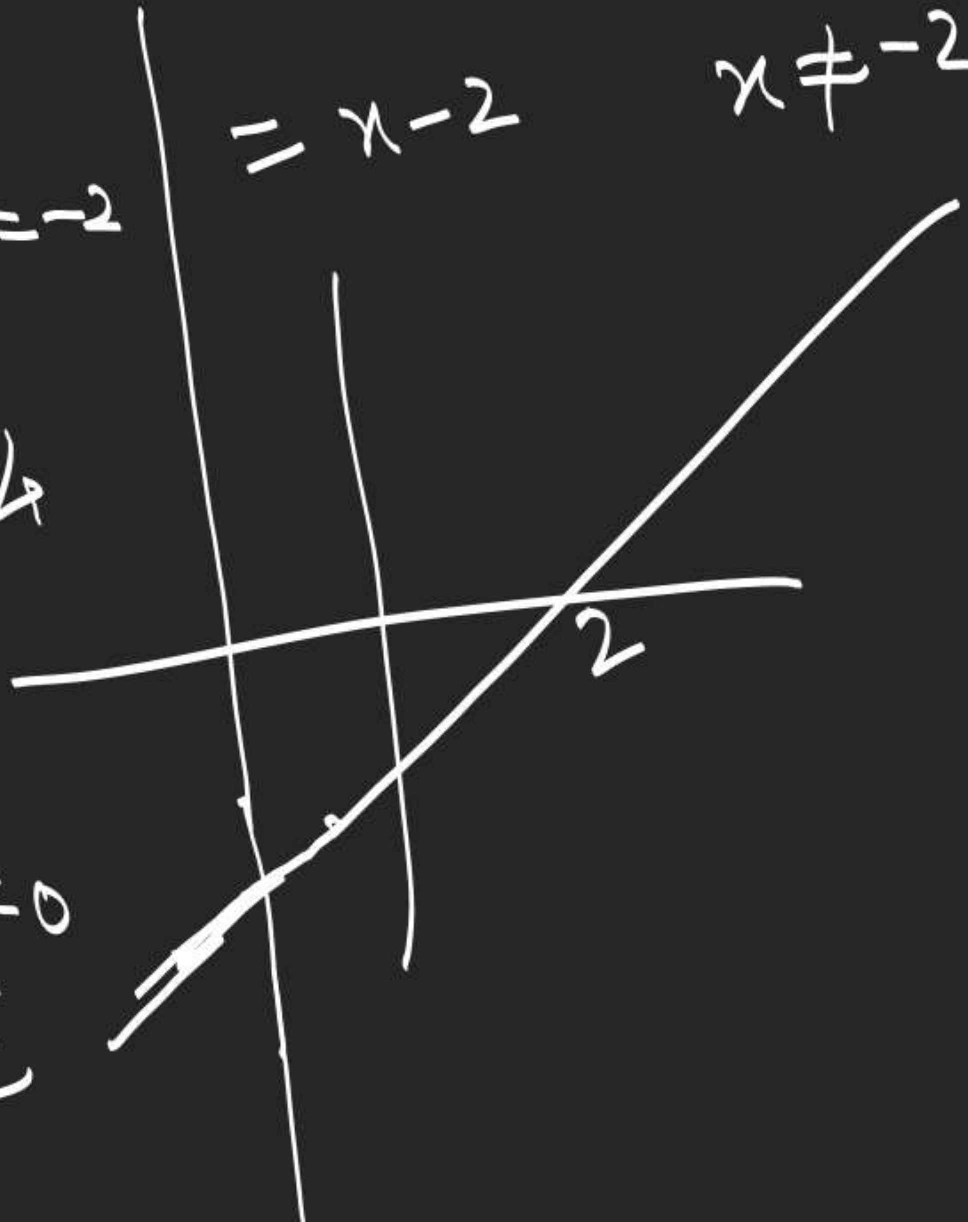


$y = \frac{x^2 - 4}{x + 2}$

$x \neq -2$

$= x - 2$

$x = -2$



$(x+2)y = x^2 - 4$

$x = -2 \quad 0 = 0$

$y \in \mathbb{R}$

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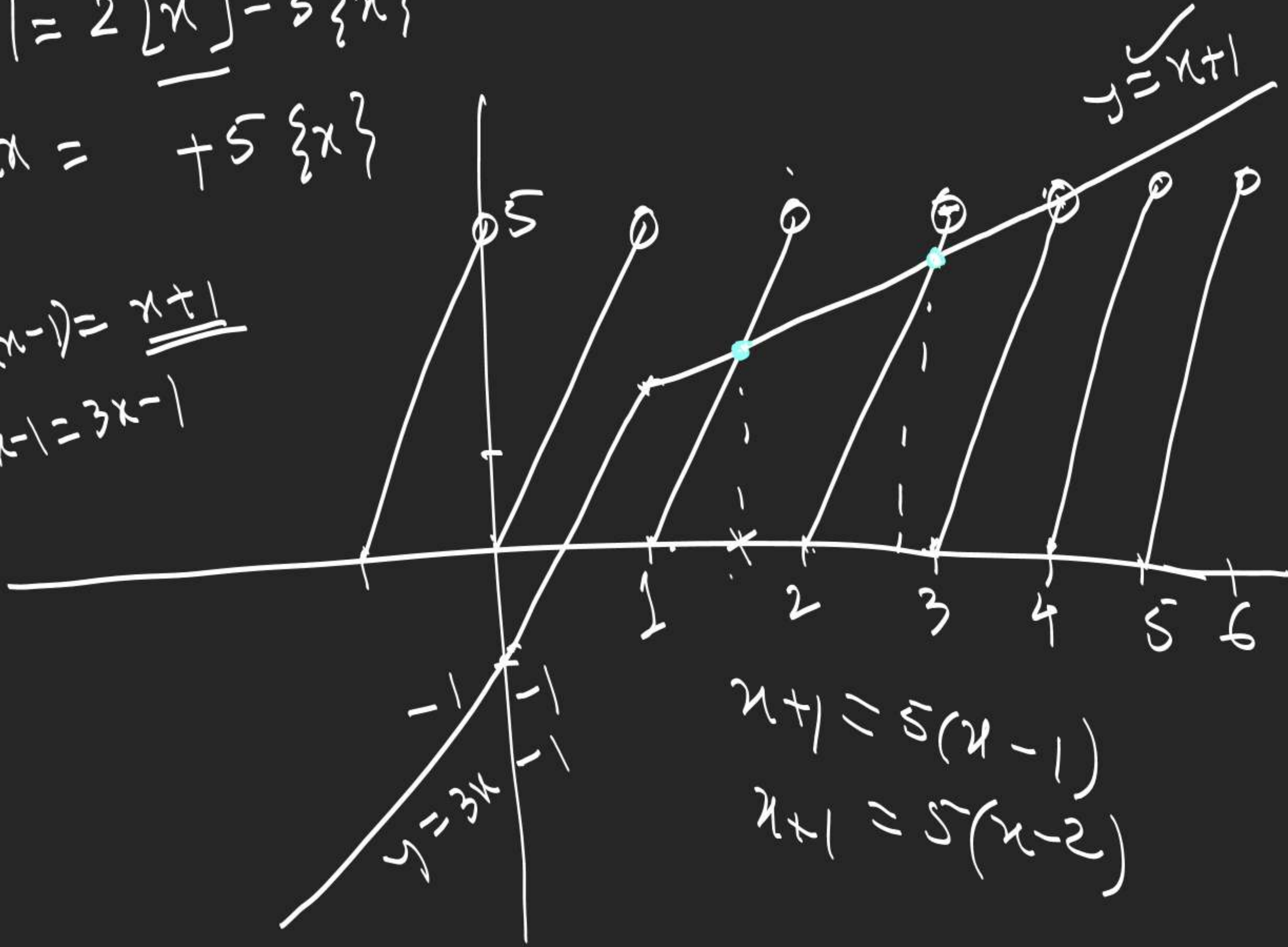
4. $|x-1| = 2[x] - 3\{x\}$

$-|x-1| + 2x = +5\{x\}$

$x \geq 1, \quad 2x-(x-1) = x+1$

$x < 1 \quad 2x+x-1 = 3x-1$



$x+1 = 5(x-1)$

$x+1 = 5(x-2)$

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2. $\cos^{-1}x - \cos^{-1}\frac{y}{2} = \alpha$

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

$x\left(\frac{y}{2}\right) + \sqrt{1-x^2}\sqrt{1-\frac{y^2}{4}} = \cos\alpha$

$\sqrt{1-x^2}\sqrt{1-\frac{y^2}{4}} = \cos\alpha - \frac{xy}{2}$

$(1-x^2)\left(1-\frac{y^2}{4}\right) = \cos^2\alpha + \frac{x^2y^2}{4} - xy\cos\alpha$

$4x^2$

$\left[0, \frac{\pi}{2}\right)$

$\sin\left(\frac{\pi}{2} - 2\tan^{-1}\sqrt{\cos\alpha}\right) = \sin x$

$\cos\left(2\tan^{-1}\sqrt{\cos\alpha}\right) = \sin x$

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$$7:\ \tan\left(2\tan^{-1}y\right) = \tan\left(\tan^{-1}x + \tan^{-1}z\right)$$

$$\frac{2y}{1-y^2} = \frac{2y}{1-xz}$$

$$xz = y^2$$

$$y = \frac{3x - x^3}{1-3x^2}$$

$$x = y = z$$

$$\tan^{-1}y = 3\tan^{-1}x$$

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Limits

$f(x)$ gets arbitrarily close to a value 'L' for all x sufficiently close to x_0, then we say that limit of $f(x)$ is L as x approaches x_0. i.e.

$$\lim_{x \to x_0} f(x) = L.$$

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$$\lim_{x \to x_0} f(x)$$

$x = 2$

$[2, 2.001]$

$\boxed{x = 2}$

rational num arbitrarily close to 2

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$$f(x) = \frac{x^2-4}{x+2} = x-2 \qquad x \neq -2$$

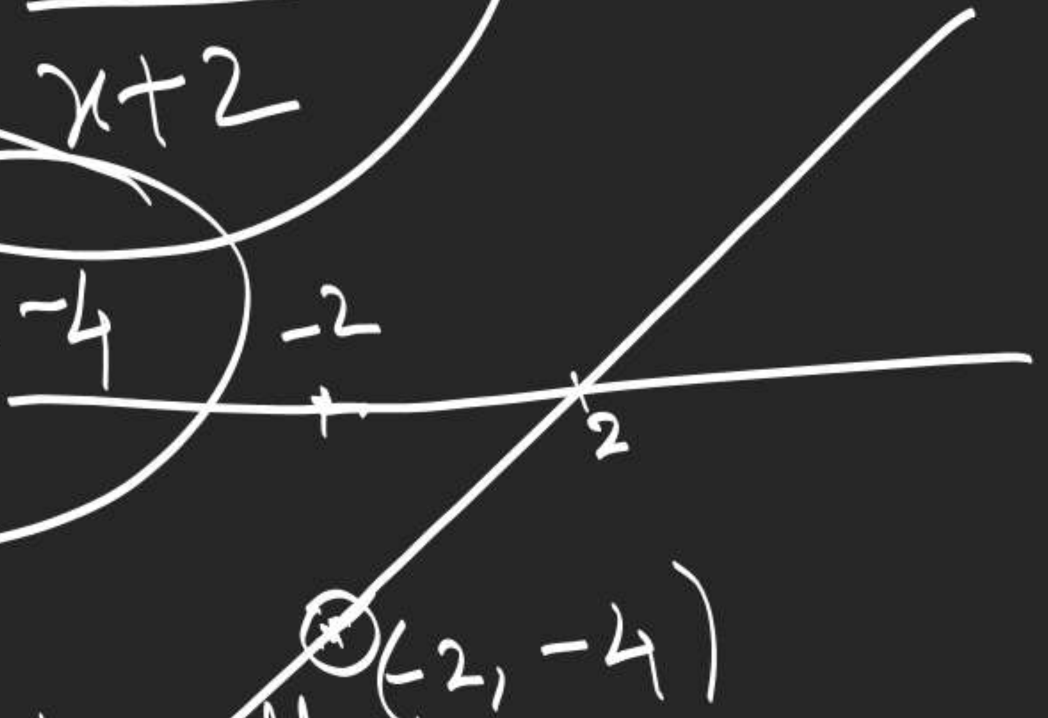
x_0

$$\lim_{x \to x_0} f(x)$$

$$\boxed{(x_0-\delta, x_0) \cup (x_0, x_0+\delta)}$$

$$\lim_{x \to -2} f(x) = -4$$

$x \neq -2$ ✓



value f(x) tend to attain for all x close to -2.

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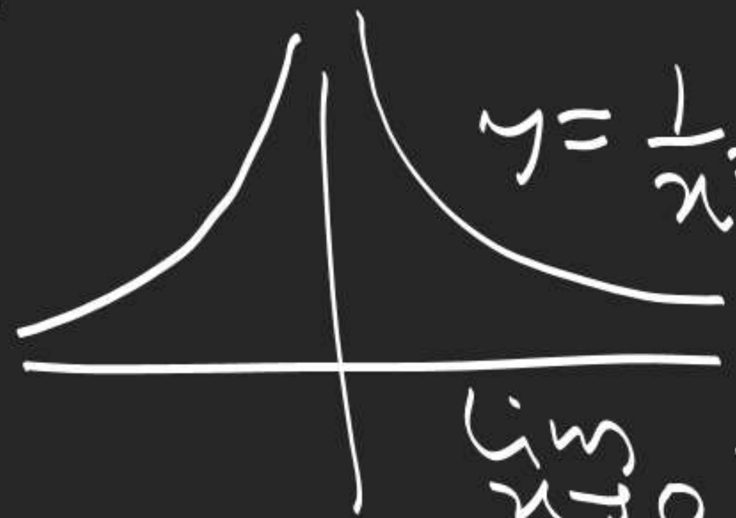
Left hand limit = LHL = $\lim\limits_{x \to x_0^-} f(x)$



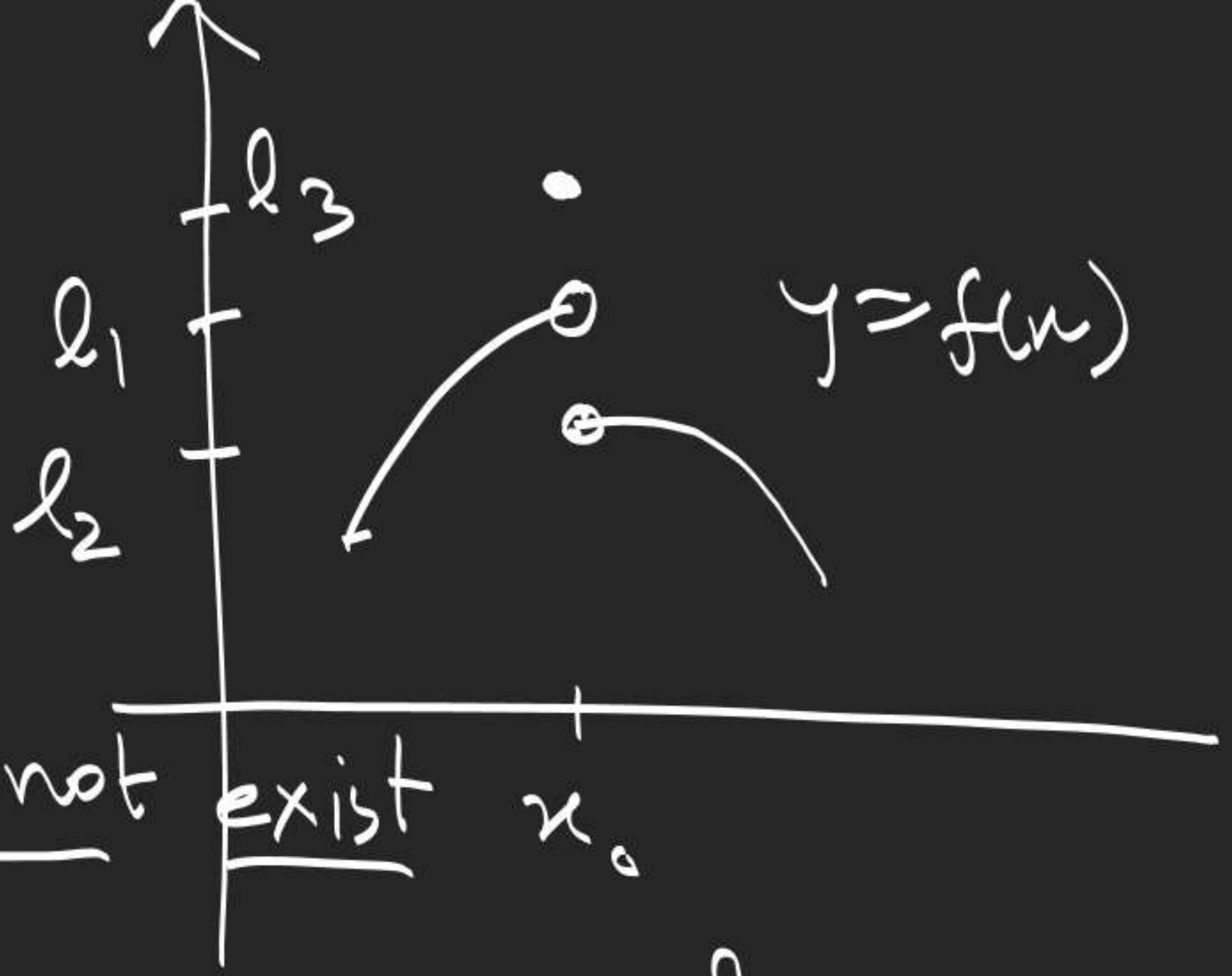
$= \lim\limits_{h \to 0} f(x_0 - h)$, $h > 0$

$\lim\limits_{x \to 0} \frac{1}{x^2} = \infty$ not exist.

Right hand limit = RHL = $\lim\limits_{x \to x_0^+} f(x) = \lim\limits_{h \to 0} f(x_0 + h)$

$h > 0$

$\boxed{\lim\limits_{x \to x_0} f(x), \text{ exist if } LHL = RHL = \text{finite} = L \Rightarrow \lim\limits_{x \to x_0} f(x) = L}$



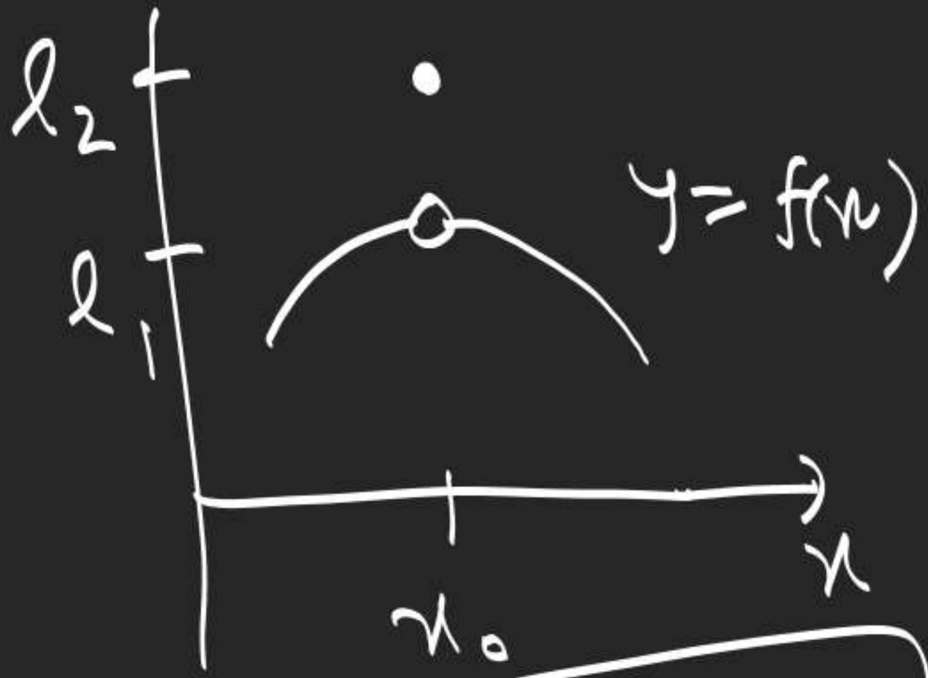
$$\lim_{x \to x_0} f(x) = \underline{\text{not}}\ \underline{\text{exist}}$$

$x \cdot \boxed{x_0}$

$LHL = l_1$

$RHL = l_2$

$f(x_0) = l_3$



$$\boxed{\lim_{x \to x_0} f(x) = l_1}$$

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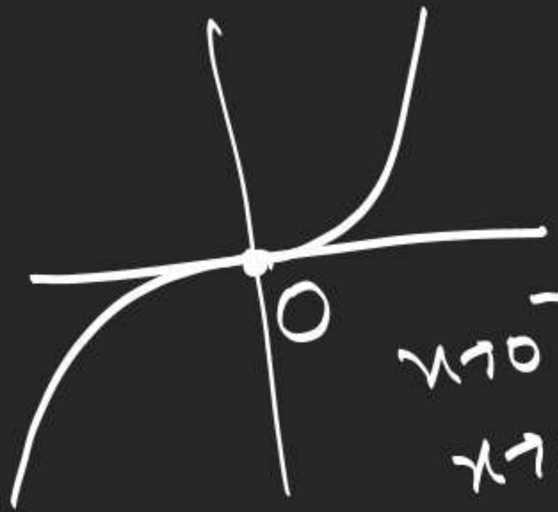
$\boxed{Ex-II}$

$$\lim_{x\to 0} x^3 = 0$$



not exist

$$\lim_{x\to -3} (\{x\}) \quad \{\cdot\} = FPF$$

LHL = 1

RHL = 0

$x\to 0^-$, $\frac{1}{x}\to -\infty$

$x\to 0^+$, $\frac{1}{x}\to \infty$

$$\lim_{x\to 0} \tan^{-1}\frac{1}{x}$$

$$LHL = \lim_{x\to 0^-} \tan^{-1}\left(\frac{1}{x}\right) = -\frac{\pi}{2}$$

$$RHL = \lim_{x\to 0^+} \tan^{-1}\left(\frac{1}{x}\right) = \frac{\pi}{2}$$

not exist