Nishant Jindal

$a > 0$ ✓

$x \to 1^-$

$LHL = (a-1)^2 - (a^2-1) = 2-2a$

$x \to 1^+$

$RHL = a^2 - a^2 = 0$

$2-2a=0$

$\boxed{a=1}$

$\boxed{f(1)=0}$

$x = a, \; a \in I$

$\boxed{a<0}$ ✓

$LHL = (a-1)^2 - a^2 = 1-2a$

$RHL = a^2 - (a^2-1) = 1$

$1-2a=1$

$a=0$

x^2

$c \in [0,1]$

$x = 2n$

-1

1

Dis cont.

$\boxed{x^2 \in I}$

$x = \pm\sqrt{n}$

$-\{I\}$

$f(c) - g(c) = 0$

$\boxed{x = I\sqrt{n}, \; n \in W}$

$[2n, 2n+1]$

$(2n+1, 2n+2)$

$a_n + \sin \pi x$

$b_{n+1} + \cos \pi x$

$b_{n+1} = a_n$

$\boxed{a_n - b_n = 1}$

$a_n = b_{n+1} - 1$

Cont. in $[0,1]$

$h(x) = f(x) - g(x)$

$h(x_1) = f(x_1) - g(x_1) \geq 0$

$h(x_2) = f(x_2) - g(x_2) \leq 0$

$f_{max} = f(x_1)$

$g_{max} = g(x_2)$

$x_1, x_2 \in [0,1]$

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8: $a+c=0$

$$\frac{\dfrac{-2\cos x+2e^x+bx\sin x-2x}{x^2}}{}$$

$$\frac{a\left(\dfrac{\cos x-e^x}{x}\right)+b\dfrac{x\sin x}{x}-\dfrac{2x}{x}}{x}$$

$$\frac{2\left(e^x-x-1\right)+2\left(1-\cos x\right)+bx\sin x}{x^2}$$

$$a\left(x\cdot\frac{\cos x-1}{x^2}+\frac{1-e^x}{x}\right)+$$

$c=2$.

$$\boxed{-a-2=0}$$

$$=\boxed{2+b}$$

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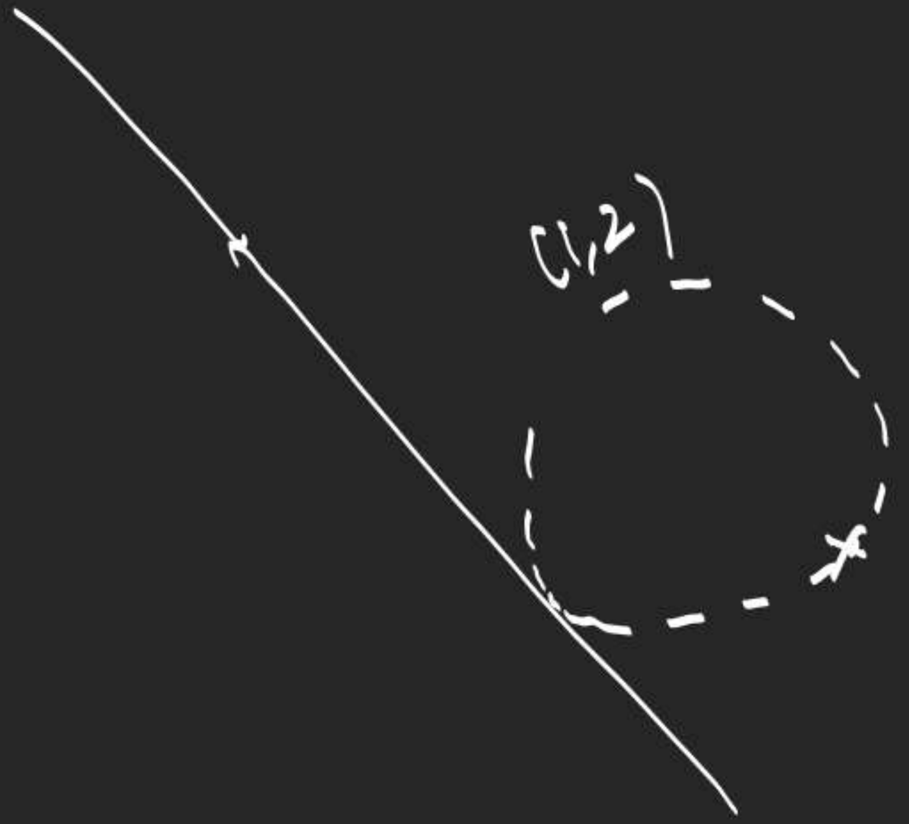
$4, 8, \quad , 20$

$67(-1) + 33(-2)$



$(2,1)^{6}\ ({}_{5}-5!\quad 15!$

18

31

$(-1 -1 -1 \ldots)$

$-\frac{1}{3} - \frac{2}{3}$

$\left[-\frac{1}{3}\right] + \ldots + \left[-\frac{1}{3} - \frac{66}{100}\right]$

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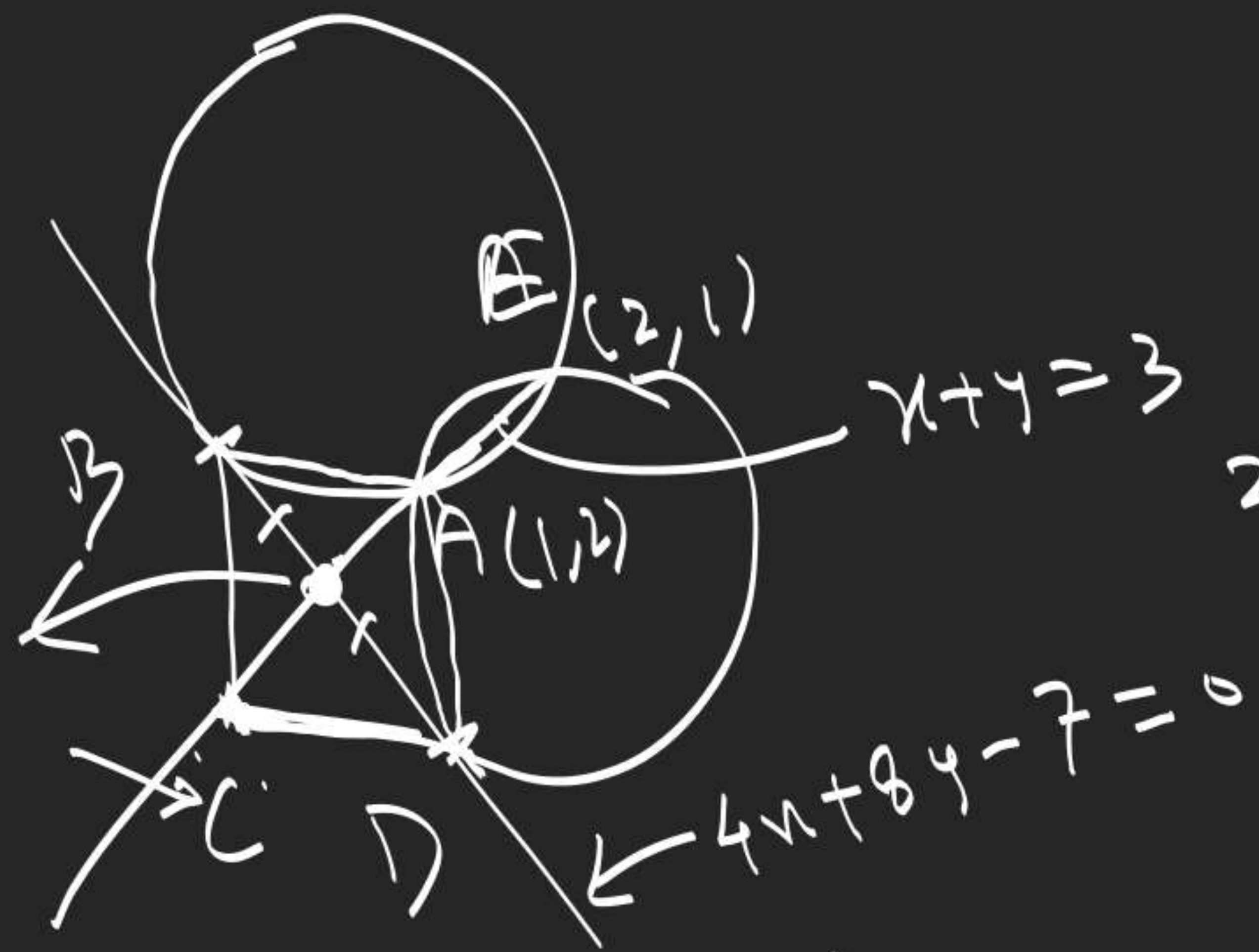

$\theta \in \left(0, \frac{\pi}{2}\right)$

$2\theta \in (0, \pi)$

$2\theta + 2\theta = \pi$

$\tan^{-1}\sqrt{x} = \frac{\pi}{4}$

Q

$$\frac{\dfrac{\sin\left(\pi - x^2\right)}{\pi - x^2} + \dfrac{\sin\left(\frac{3\pi}{2} - \frac{3x^2}{2}\right)}{\pi - x^2}}{\dfrac{\sin\left(\frac{\pi}{2} - \frac{x^2}{2}\right)}{\pi - x^2} + \dfrac{\sin\left(2\pi - 2x^2\right)}{\pi - x^2}\cos^2\left(\pi - x^2\right)}$$

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$$\frac{(c-d)^2}{a-b} = 18$$

$$\frac{(c+d)^2}{a-b} = 72$$

$$\frac{c-d}{c+d} = \frac{1}{2}$$

$$\frac{c}{d} = \frac{3}{1}$$

$d=3, \quad c=9$

$(a, b) = (3, 1)$

$d = 3k$

$a-b = 2k^2$

$\boxed{c = 3d} \Rightarrow \boxed{c = 9k}$

$$\boxed{a-b = \frac{2d^2}{9}}$$

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$$\lim_{x\to 2} \frac{\frac{1+\sqrt{1+4x}}{2} - 2}{x-2}$$

5

$$f(x) = \begin{cases} -\pi - 2\tan^{-1}x & (-\infty, -1] \\ 2\tan^{-1}x & [-1, 1] \\ \pi - 2\tan^{-1}x & [1, \infty) \end{cases}$$

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

$\tan^{-1}x = \theta$

$\sin^{-1}\sin 2\theta$

$\left(-\frac{\pi}{2}, -\frac{\pi}{4}\right]$

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

$y = \sqrt{x + \sqrt{x + \sqrt{x + \cdots}}}$

$y = \sqrt{x+y}$

$y^2 - y - x = 0$

$y = \frac{1 \pm \sqrt{1+4x}}{2}$

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$$\overset{4}{(1+x^2)^4}\ \overset{3}{(x^3-1)^7}\ \overset{4}{\left(2+\frac{x}{1}\right)^{12}}$$

$0 \quad 3 \quad 8$

$${}^4C_0\,{}^7C_6(-1)^6\,{}^{12}C_2\,2^{10} + {}^4C_2\,{}^7C_6\,{}^{12}C_1\,2^{11}$$

$2 \quad 9 \quad 0$

$$+ {}^{12}C_0\,2^{12}\,{}^7C_4(-1)^4\,{}^4C_1$$

$8 \quad 3 \quad 0$

$$+ {}^{12}C_0\,2^{12}\,{}^7C_6(-1)^6\,{}^4C_4$$