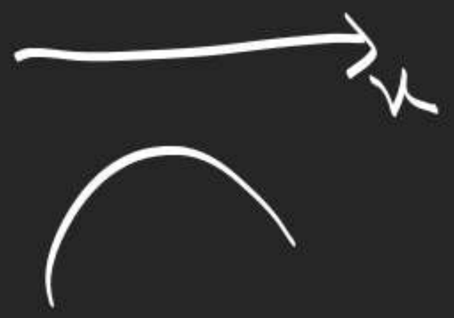
Nishant Jindal

$$\sum (x-a)(x-b)$$



$$a=b=c$$

$$\frac{3}{x-a}=0 \qquad \phi$$

$$a=b\neq c$$

$$\frac{2}{x-a}+\frac{1}{x-c}=0$$

$$\frac{3x-2c-a}{(x-a)(x-c)}=0 \quad \text{—} \quad (1)$$

$a\neq b\neq c$.

$a<b<c$.

$$\frac{\sum (x-a)(x-b)}{(x-a)(x-b)(x-c)}=0$$

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$(a-2)^2+2(a+1) = \boxed{a^2-2a+6}$

$\frac{\alpha}{\beta} = \frac{\alpha'}{\beta'}$

$ax^2+bx+c=0$ with roots α, α^n

$\frac{c}{a} = \alpha^{n+1} \Rightarrow \left(\frac{c}{a}\right)^{\frac{1}{n+1}} = \alpha$

$\frac{\alpha-\beta}{\alpha+\beta} = \frac{\alpha'-\beta'}{\alpha'+\beta'}$

$\frac{(\alpha+\beta)^2-4\alpha\beta}{(\alpha+\beta)^2} = \frac{(\alpha'+\beta')^2-4\alpha'\beta'}{(\alpha'+\beta')^2}$

$\tan\theta+\sec\theta = -\frac{b}{a}$

$\sec\theta-\tan\theta = -\frac{a}{b}$

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

$\boxed{\frac{q}{p^2} = \frac{c}{b^2}}$

$(2K), (3K)$

$a\left(\frac{c}{a}\right)^{\frac{2}{n+1}} + b\left(\frac{c}{a}\right)^{\frac{1}{n+1}} + c = 0$

$6K^2 = \frac{5}{12}$

$K = \pm\frac{1}{6}\sqrt{\frac{5}{2}}$

$\frac{m}{12} = 5K \Rightarrow m = 60\left(\pm\frac{1}{6}\sqrt{\frac{5}{2}}\right)$

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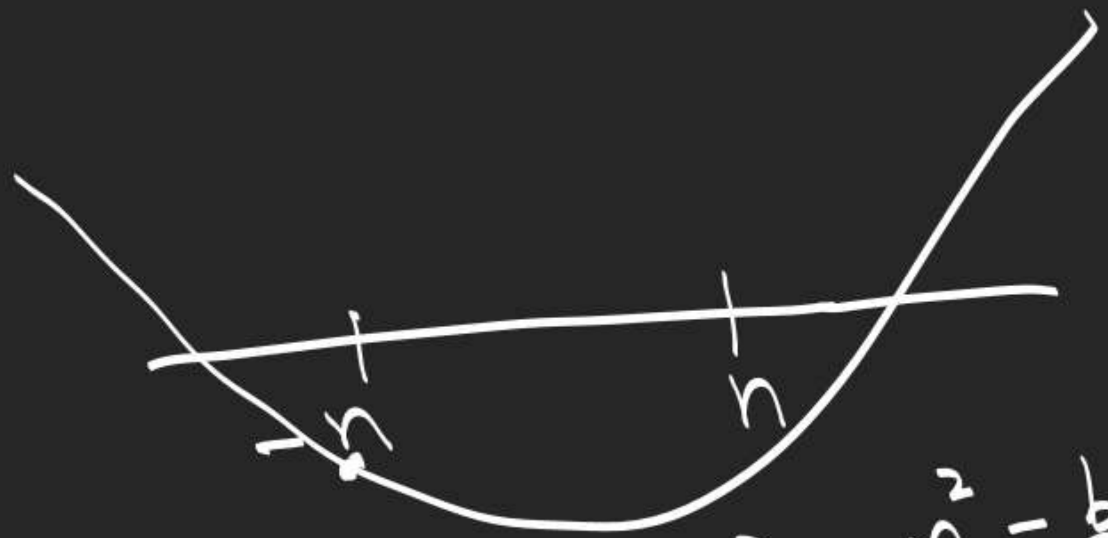
$$(\sin\theta - 1)^2 + \cos^2\theta = 2 - 2\sin\theta$$

Nishant Jindal

1. $\alpha < -n$, $\beta > n$, $n \in N$ $1 + \frac{c}{an^2} + \frac{1}{n}\left|\frac{b}{a}\right| < 0$, $n \in N$.

$f(x) = x^2 + \frac{b}{a}x + \frac{c}{a} = 0 < {\alpha \atop \beta}$



$a < 3$ $a < -3$

$a < -3$

$f(-n) < 0 \Rightarrow n^2 - \frac{b}{a}n + \frac{c}{a} < 0 \Rightarrow 1 + \frac{c}{an^2} < \frac{b}{an}$

&

$f(n) < 0 \Rightarrow n^2 + \frac{b}{a}n + \frac{c}{a} < 0 \Rightarrow 1 + \frac{c}{an^2} < -\frac{b}{an}$

$1 + \frac{c}{an^2} < -\left|\frac{b}{an}\right|$

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$(-\infty, -1) \cup (4, \infty)$ ✓

$f(x) = x^2 - 2px + 3p + 4 < 0$ for atleast one real x.

$D > 0$ ✓

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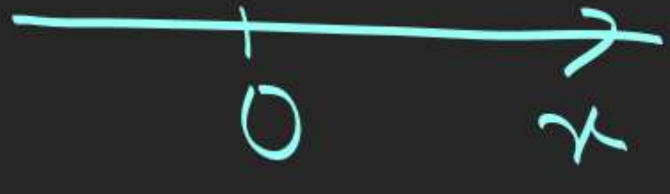
1. Find 'm' for which inequality $\overset{f(x)}{mx^2-4x+3m+1>0}$ is satisfied for all positive x.

$m=0$ ✗

$-4x+1>0$

$x<\frac{1}{4}$

$\underline{m>0} \rightarrow D<0$



$\cancel{16}-\cancel{4}m(3m+1)<0$

$3m^2+m-4>0$

$-3m+4m$

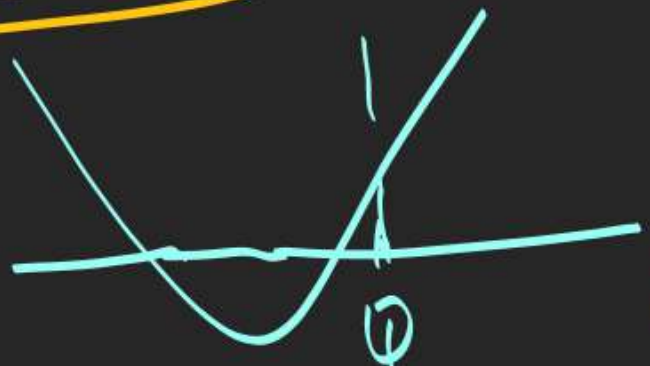
$(3m+4)(m-1)>0$

$m<0$ ✗

$\boxed{m\in(-\infty,-\frac{4}{3})\cup(1,\infty)}$

$\boxed{m\in(1,\infty)}$

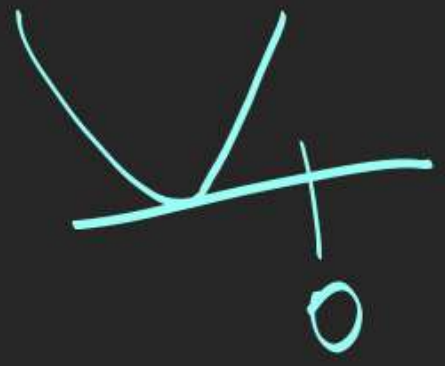
$\underline{m>0}$ ✓

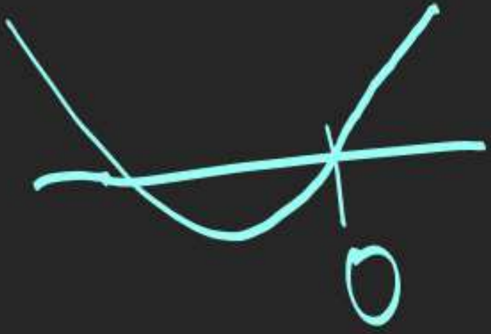


$f(0)\geq 0$

$\frac{2}{m}\leq 0$ ✓

$\Rightarrow \boxed{m<0}$





$D\geq 0$

$m\in\phi$ ✓

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$x \to -\infty,\ f(x) \to 0$

$$f(x) = \frac{4 - \frac{1}{x}}{x\left(1 + \frac{3}{x^2}\right)}$$

$$\boxed{m \in (1, \infty)}$$

$m > \frac{4x-1}{x^2+3}$; ① $\forall x > 0$

② for atleast one $x > 0$, $\boxed{\left(-\frac{1}{3}, \infty\right)}$

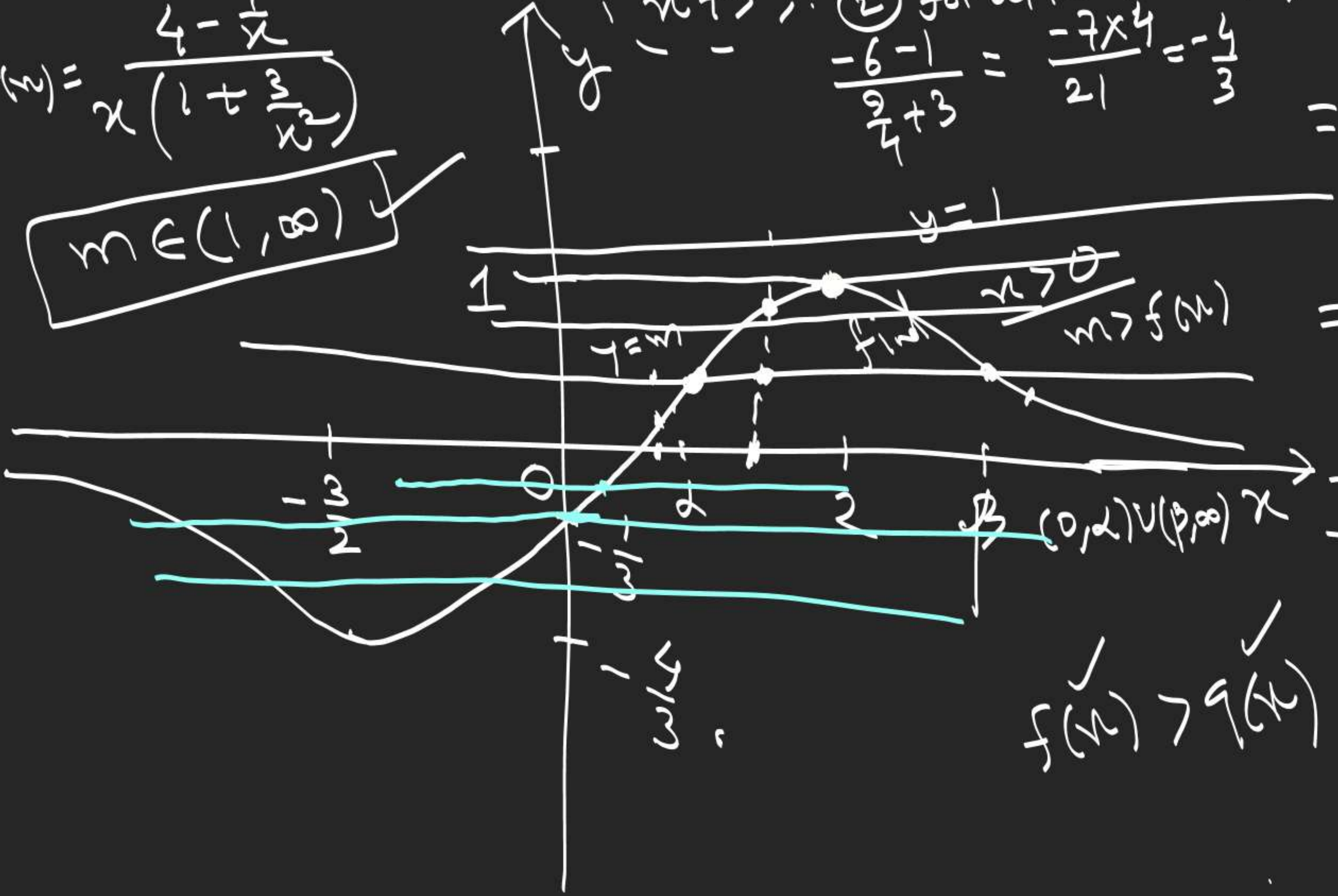
$$\frac{-6-1}{\frac{9}{4}+3} = \frac{-7\times 4}{21} = -\frac{4}{3}$$

$$\frac{4(x^2+3) - (4x-1)2x}{(x^2+3)^2}$$

$$= \frac{2(x - 2x^2 + 6)}{(x^2+3)^2}$$

$$= \frac{-2(2x^2 - x - 6)}{(x^2+3)^2}$$

$$= -\frac{(2x+3)(x-2)}{(x^2+3)^2}$$



$f(x) > g(x)$

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Q: Find 'a' for which the inequality $4^x - a(2^x) - a + 3 \leq 0$ is satisfied for atleast one real x.

$\boxed{\text{PT-5,6,7}}$

3: I) $x^2 - (a+1)x + a - 1 = 0$, find all integral values of a, so that eqn. has integral roots.

4. Let $f(x) = a_n x^n + a_{n-1} x^{n-1} + \dots + a_2 x^2 + a_1 x + a_0$, $a_i \in I$

If $f(0)$ & $f(1)$ are both odd, then P.T. $f(x) = 0$ can't have integral roots.