بابا طلبی ۲۰ کلاس ۲۳ دوازدهم تجربی A

$g(x) = f(\tan^2 x + \sqrt{2}\cos x) \longrightarrow g'(x) = \left(2(1+\tan^2 x)\tan x - \sqrt{2}\sin x\right) f'(\tan^2 x + \sqrt{2}\cos x)$ ۱-

$\Rightarrow x = \frac{\pi}{4} \Rightarrow g'\left(\frac{\pi}{4}\right) = \left(2(1+1)\cdot 1 - \frac{2\sqrt{2}}{2}\right) f'\left(1 + \frac{2\sqrt{2}}{2}\right)$

$\Rightarrow 3f'(2) = \sqrt{3} \Rightarrow f'(2) = \frac{\sqrt{3}}{3}$

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$g(x) = \frac{2}{2-\cos x} \Rightarrow g'(x) = \frac{-2\sin x}{(2-\cos x)^2} \Rightarrow g'\left(\frac{7\pi}{6}\right) = \frac{4}{19+8\sqrt{3}}$ ۲-

$f(x) = \frac{x+\cos^3 x}{4-\cos^2 x} \Rightarrow f'(x) = \frac{(3x - \sin x\cos^2 x)(4-\cos^2 x) - (2\sin x\cos x)(x+\cos^3 x)}{(4-\cos^2 x)^2}$

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$\Rightarrow f'\left(\frac{7\pi}{6}\right) = \frac{\frac{13}{16} - 2\sqrt{3} + \frac{9}{16}}{\frac{169}{16}} \Rightarrow \frac{\frac{135 - 12\times 8\sqrt{3}}{338}}{} \cdot \frac{8}{19+8\sqrt{3}} = -\frac{169}{338} = -\frac{1}{2}$

$f'(x) \longrightarrow \lim_{x\to \frac{3}{4}^+} \frac{(4x-3)(\sqrt{ax})}{x-\frac{3}{4}} = 4\sqrt{\frac{3a}{4}} = 2\sqrt{3a}$ ۳-

$\lim_{x\to \frac{3}{4}^-} \frac{-(4x-3)(\sqrt{ax})}{x-\frac{3}{4}} = -4\sqrt{\frac{3a}{4}} = -2\sqrt{3a}$

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$2\sqrt{3a} - (-2\sqrt{3a}) = 2\sqrt{6} \Rightarrow 4\sqrt{3a} = 2\sqrt{6} \Rightarrow \sqrt{3a} = \frac{\sqrt{6}}{2} \Rightarrow a = \frac{1}{2}$

$f'(4) = -a,\ f(4) = 3 - 4a \qquad f(4) + f'(4) = -1 \Rightarrow 3 - 4a - a$ ۴-

$= -1 \Rightarrow 5a = 4 \Rightarrow a = \frac{4}{5} \Rightarrow f'(4) = -0{,}8$

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$y = \frac{x-5}{7} = \frac{ax-1}{2x+1} \Rightarrow 2x^2 + (14-7a)x + 12 = 0 \quad \Delta = 0$ ۵-

مماس است.

$(14-7a)^2 - 4\times 12\times 2 = 0 \Rightarrow (14-7a)^2 = 144 \Rightarrow 14-7a = 12$

$\Rightarrow a = \frac{2}{7}$ قبول $\quad \cancel{14-7a = -12} \Rightarrow a = \frac{26}{7}$ قق

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$f(2)=0 \Rightarrow 8+2a-b=0 \Rightarrow 8-24-b=0 \Rightarrow b=-16 \quad , f'(2)=12+a=0$ -6

$\Rightarrow a=-12 \Rightarrow \cancel{\;} = b-a=-16-(-12)=-4$ 2

$f(x)=\sin^n(x^2) \qquad \lim \dfrac{f(x)f'(x)}{(1-\cos x)^m} = 32\sqrt{2}$ -7

$\Rightarrow \lim \dfrac{2nx\cos(x^2)\sin^{2n-1}(x^2)}{(1-\cos(x))^m} \qquad f'(x)=n\sin^{n-1}(x^2)\cos(x^2)\cdot 2x$

نکته $\sin x \underset{x\to 0}{=} 0 \qquad 1-\cos x \underset{x\to 0}{=} \dfrac{x^2}{2} \Rightarrow \dfrac{(2nx)(x^2)^{2n-1}}{\dfrac{x^{2m}}{2^m}}$ 2

$\Rightarrow x^{2m} = x^{2n-1} \Rightarrow 2m = 2n-1 \Rightarrow \qquad 2^{m+2} = 2^{4,5}$

$\Rightarrow m = 2,5$

$\Rightarrow 2m+n = 7+2 = 9 \qquad , n = 2^{m+1} = 2^1 = 2 \Rightarrow n = 2$

$y = \dfrac{\sqrt{x}+1}{\sqrt{x}-1} \Rightarrow y\sqrt{x}-y = \sqrt{x}+1 \Rightarrow \sqrt{x}(y-1) = y+1$ -8

$\Rightarrow \sqrt{x} = \dfrac{y+1}{y-1} \Rightarrow x = \left(\dfrac{y+1}{y-1}\right)^2 \Rightarrow f^{-1}(x) = \left(\dfrac{x+1}{x-1}\right)^2$ 2

$\Rightarrow f^{-1'} = 2\left(\dfrac{x+1}{x-1}\right)\left(\dfrac{(x-1)-(x+1)}{(x-1)^2}\right) \Rightarrow f^{-1'}(2) = -12$

$\dfrac{f(0)-f(-1)}{0-(-1)} = \dfrac{1-(8(1-a))}{1} \Rightarrow 8a-7 = -11 \Rightarrow a = -\dfrac{1}{2}$ 9

2

$f(x) = (x^2+1)^4\left(-\dfrac{x}{2}+1\right) \Rightarrow f'(x) = 4(2x)(x^2+1)^3\cdot\left(-\dfrac{x}{2}+1\right) +$

$-\dfrac{1}{2}(x^2+1)^4 \Rightarrow f'(1) = 8$

$y = \sin x\cos x \longrightarrow \left[\dfrac{\pi}{4}, \dfrac{\pi}{2}\right] \Rightarrow \dfrac{f(\frac{\pi}{4})-f(\frac{\pi}{2})}{\frac{\pi}{4}-\frac{\pi}{2}} = 0$ 2

$= \dfrac{-1}{\frac{\pi}{4}} = -\dfrac{4}{\pi} \qquad y = \sin^4 x - \cos^4 x \longrightarrow \dfrac{f(\frac{\pi}{4})-f(\frac{\pi}{2})}{\frac{\pi}{4}-\frac{\pi}{2}} = \dfrac{4}{\pi}$

$\Rightarrow \dfrac{-\frac{4}{\pi}}{\frac{4}{\pi}} = -1$

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