بابا طاهر   فصل ۲۳   دوازدهم ت A

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

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

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

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

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

$\Rightarrow f'(\frac{7\pi}{6})=\frac{\frac{13}{4}-2\sqrt{3}\cdot\frac{9}{16}}{\frac{169}{16}} \Rightarrow \frac{52-18\sqrt{3}}{338} \cdot \frac{\Delta}{19+8\sqrt{3}}=-\frac{169}{338}=-\frac{1}{2}$

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

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

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

$f'(4)=-a,\ f(4)=2-4a \quad f(4)+f'(4)=-1 \Rightarrow 2-4a-a$ -۴

$=-1 \Rightarrow 5a=3 \Rightarrow a=\frac{3}{5} \Rightarrow f'(4)=-0.6$

$y=\frac{x-5}{7}=\frac{ax-1}{2x+1} \Rightarrow 2x^2+(16-7a)x+12=0 \quad \Delta=0$ -۵

مماس؟

$(16-7a)^2-4\times 12\times 3=0 \Rightarrow (16-7a)^2=144 \Rightarrow 16-7a=12$

$\Rightarrow a=\frac{4}{7} \Rightarrow$ ق ق ق $\quad 16-7a=-12 \Rightarrow a=4 \Rightarrow$ ق ق

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

$\Rightarrow a=-12$ $\Rightarrow b-a=-16-(-12)=-4$

$f(x)=\sin^n(x^2)$ $\lim f(x)f'(x) = 32\sqrt{2}$ —7

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

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

$\Rightarrow x^{2m} = x^{2n-1} \Rightarrow 2m = 2n-1$ 2^{m+2} ... $\Rightarrow m=3$

$\Rightarrow 2m = 8 = 7+2 = 9$, $n=2^{m+1}=2^4=32 \Rightarrow n=2$

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

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

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

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

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

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

$y=\sin x\cos x$ $\rightarrow \left[\frac{\pi}{4},\frac{\pi}{2}\right] \Rightarrow \frac{f(\frac{\pi}{2})-f(\frac{\pi}{4})}{\frac{\pi}{2}-\frac{\pi}{4}}$ 10

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

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