Subject: ۱۷,۲۵

Year: Month: Day: آرین غضنفری سوادکوهی Page:( )

۱- $g(x)=f(\tan x+\sqrt{2}\cos x)$, $g'(\frac{\pi}{4})=\sqrt{3}$

$g'(x)=f'(\tan^2 x+\sqrt{2}\cos x)\times(\underbrace{2\tan(1+\tan^2 x))-\sqrt{2}\sin x}_{3})$

$g'(\frac{\pi}{4})=f'(1+1)\times 3$ $f'(2)=\frac{\sqrt{3}}{3}$ ۲

۲- $g(x)=\frac{3}{2-\cos x}$, $f(x)=\frac{8+\cos^3 x}{4-\cos^2 x}$ $f'(\frac{7}{3}\pi)-3g'(\frac{7}{3}\pi)\to(f-3g)'(\frac{7}{3}\pi)$

$f(x)=\frac{(2+\cos x)(4+\cos^2 x-2\cos x)}{(2-\cos x)(2+\cos x)}=\frac{4+\cos^2 x-2\cos x}{2-\cos x}$ $(f-3g)(x)=\frac{\cos^2 x-2\cos x}{2-\cos x}$ ۲

$(f-3g)(x)=\frac{\cos(\cos-2)}{2-\cos}=-\cos \xrightarrow{\text{مشتق}} (f-3g)'=\sin x \xrightarrow{x=\frac{7}{3}\pi} -\frac{1}{2}$

۳- $f'_+(\frac{3}{2})=(2x-3)\sqrt{ax} \xrightarrow{\text{مشتق}} 2\sqrt{ax}+(2x-3)\frac{a}{2\sqrt{ax}}$

$f'_-(\frac{3}{2})=+(-2x+3)\sqrt{ax} \longrightarrow -2\sqrt{ax}+(-2x+3)\frac{a}{2\sqrt{ax}}$ $\Delta f'=8\sqrt{ax}$

$8\sqrt{\frac{3}{2}a}=2\sqrt{6}$ $16\frac{3}{2}a=6$ $a=\frac{1}{2}$ ۲

۴- $y=ax+3 \nearrow f(2)=-2a+3$ $-5a+3=-1$ $a=\frac{4}{5}$

$\searrow f'(2)=-a$

$f'(2)=-0.6$ ۲

۵- $7y=x+5 \xrightarrow{y=x} 6x=5 \to x=\frac{5}{6}$

6) $y=\frac{x}{7}+\frac{5}{7}\to y'=\frac{1}{7}$ ۱,۲۵

$y=\frac{9x-1}{3x+1}\to y'=\frac{a+3}{(3x+1)^2}=\frac{1}{7}\xrightarrow{x=\frac{5}{6}} a=-\frac{5}{2}$

۶- مختصات نقطه $\to (2,0)\to 8+2a-b=0\to b=-16$

شیب $\to 0 \to 3x^2+a=0\to -12=a$ ۲

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

$$y=\frac{x^2+2x+1}{x^2-2x+1} \rightarrow y'=\frac{-4x^2+4}{(x^2-2x+1)^2} \xrightarrow{x=2} y'=-12$$

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$$f(x)=(x^2+1)^3(ax+1) \begin{cases} \xrightarrow{x=0} 1 \\ \xrightarrow{x=-1} 8(-a+1) \end{cases}$$

$$\frac{1-(-8a+8)}{1}=8a-7=-11$$

$$a=-\frac{1}{2}$$

$$f'(1)=3(x^2+1)^2(2x)\left(-\frac{1}{2}x+1\right)+-\frac{1}{2}(x^2+1)^3=8$$

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$$y=\sin x\cos 2x \begin{cases} \xrightarrow{x=\frac{\pi}{4}} y=\frac{\sqrt{2}}{2}\times 0=0 \\ \xrightarrow{x=\frac{\pi}{2}} y=1\times -1=-1 \end{cases}$$

$\Longrightarrow$ آهنگ متوسط $=\dfrac{-1-0}{\frac{\pi}{2}-\frac{\pi}{4}}=\dfrac{-1}{\frac{\pi}{4}}$ ①

$$y=\sin^2 x-\cos^2 x \begin{cases} \xrightarrow{x=\frac{\pi}{4}} \frac{1}{2}-\frac{1}{2}=0 \\ \xrightarrow{x=\frac{\pi}{2}} 1-0=1 \end{cases} \rightarrow \frac{1-0}{\frac{\pi}{4}}=\frac{4}{\pi}$$ ②

$$\frac{①}{②}=-1$$

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$$\frac{a_n - 1}{3n+1} = \frac{n}{7} + \frac{5}{7} \longrightarrow 7a_n - 7 = 3n^2 + n + 15n + 5$$

$$3n^2 + n(16 - 7a) + 12 = 0 \xrightarrow{\Delta = 0} (16-7a)^2 - 12^2 = (16 - 7a - 12)(16 - 7a + 12)$$

$\boxed{a = \frac{4}{7}}$ $\boxed{a = 4}$

$\boxed{a = 4} \longrightarrow 3n^2 - 12n + 12 \longrightarrow \boxed{n = 2}$ ✓

$a = \frac{4}{7} \longrightarrow 3n^2 + 12n + 12 \longrightarrow n = -2$ ناصحیح است x

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$$\lim_{x \to 0} \frac{\sin^n(x^2) \times 2x \sin^{n-1}(x^2) \times \cos x^2}{(2\sin^2\frac{x}{2})^m} \xrightarrow{\text{هم ارزی}} \lim_{x \to 0} \frac{(x^2)^n \times n \times (x^2)^{n-1} \times 2x}{(2(\frac{x}{2})^2)^m} = \frac{(x)^{2n+2n-2+1} \times 2n}{(x)^{2m} \times \frac{1}{2}}$$

$$= \frac{2nx^{4n-1}}{\frac{1}{2^m} \times x^{2m}} = 2^{m+1} \times n \times x^{4n-2m-1}$$

پس $4n - 2m - 1 = 0 \longrightarrow n = \frac{2m+1}{4}$

لذا $2^{m+1} \times \frac{2m+1}{4} = 32\sqrt{2} \longrightarrow m = \frac{7}{2}, n = 2 \longrightarrow \boxed{2m + n = 9}$