نام و نام خانوادگی علیرضا نوروزی پاسخنامه تشریحی تکلیف شماره ۲۳ کلاس A (جمعه‌ها)

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

$$\left.\begin{array}{l} g'(\frac{\pi}{4})=f'(2)(3) \\ g'(\frac{\pi}{4})=\sqrt{3} \end{array}\right\} f'(2)=\frac{\sqrt{3}}{3}$$

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

$$h(x)=-\cos x\xrightarrow{\prime}h'(x)=\sin x\longrightarrow h(\frac{7\pi}{6})=\frac{-1}{2}$$

$$\left\{\begin{array}{l} \frac{3}{4}^{+}\longrightarrow(4x-3)\sqrt{ax}\xrightarrow{\prime}f'_{+}(\frac{3}{4})=4\sqrt{ax}+\frac{a}{2\sqrt{ax}}(4x-3) \\ \frac{3}{4}^{-}\longrightarrow(3-4x)\sqrt{ax}\xrightarrow{\prime}f'_{-}(\frac{3}{4})=(-4\sqrt{ax})+\frac{a}{2\sqrt{ax}}(3-4x) \end{array}\right.$$

$$f'_{+}(\frac{3}{4})-f'_{-}(\frac{3}{4})=8\sqrt{ax}\xrightarrow{x=\frac{3}{4}}4\sqrt{3a}=2\sqrt{6}\longrightarrow a=\frac{1}{2}$$

$$y=-ax+2\xrightarrow{x=4}(4,-4a+2)$$

$$\lfloor\!\!\to f'(x)=-a$$ ۴

$$f(4)+f'(4)=-1\longrightarrow-4a+2+(-a)=-1\longrightarrow a=\frac{3}{5}$$

$$f'(4)=\frac{-3}{5}$$

$$\left.\begin{array}{l} 7y=x+5 \\ 7y=\frac{7ax-7}{3x+1} \end{array}\right\}\xrightarrow{\ominus}x+5=\frac{7ax-7}{3x+1}\longrightarrow 3x^2+(16-7a)x+12=0$$ ۵

$$\Delta=0\longrightarrow(16-7a)^2=144\longrightarrow\begin{cases}16-7a=12\longrightarrow a=\frac{4}{7}\\16-7a=-12\longrightarrow a=4\end{cases}$$

$$\begin{cases}a=\frac{4}{7}\longrightarrow 3x^2+12x+12=0\longrightarrow(x+2)^2=0\longrightarrow x=-2 \text{ غ‌ق‌ق}\\ a=4\longrightarrow 3x^2-12x+12=0\longrightarrow(x-2)^2=0\longrightarrow x=+2 \text{ ق‌ق}\end{cases}$$

$$\Longrightarrow a=4$$

$(2,0) \longrightarrow 0=8+2a-b \longrightarrow 2a-b=-8$

$f'(2)=0 \longrightarrow 3x^2+a=0 \xrightarrow{x=2} 12+a=0 \longrightarrow a=-12$ ۶

$-24-b=-8 \longrightarrow b=-16$

خواسته سوال $=b-a=-4$

$x\to 0$ چون $\Rightarrow$ هم‌ارزی $\Rightarrow \sin^n(x^2) \sim x^{2n}$, $1-\cos(x) \sim \frac{x^2}{2}$

$f(x)=x^{2n} \longrightarrow f'(x)=2n(x)^{2n-1}$

$$\lim_{x\to 0} \frac{2n(x)^{4n-1}}{\frac{x^{2m}}{2^m}} = \lim_{x\to 0}(2n.2^m)(x)^{4n-1-2m} = 32\sqrt{2} \rightarrow 4n-1-2m=0 \rightarrow m=2n-\frac{1}{2}$$

$$2n.2^{2n-\frac{1}{2}} = 2^{\frac{1}{2}}\times 2^5 \longrightarrow \frac{2n.2^{2n}}{2^{\frac{1}{2}}} = 2^{\frac{1}{2}}\times 2^5 \longrightarrow 2n\times 2^n = 64 \longrightarrow n=2 \rightarrow m=\frac{7}{2}$$

خواسته سوال $=2m+n=9$

$$\left.\begin{array}{l} f(x)\longrightarrow m \\ f^{-1}(x)\longrightarrow \frac{1}{m}\end{array}\right\} \longrightarrow f'(x)=\frac{\frac{1}{2\sqrt{x}}(\sqrt{x}-1)-\left(\frac{1}{2\sqrt{x}}\right)(\sqrt{x}+1)}{(\sqrt{x}-1)^2} = \frac{-1}{\sqrt{x}(\sqrt{x}-1)^2}$$ ۸

$f(x)=2 \longrightarrow \sqrt{x}+1=2\sqrt{x}-2$

$\sqrt{x}=3$

$x=9$

$f'(9)=\frac{-1}{3(4)}=m$

$f^{-1\prime}(2)=\frac{1}{m}=-12$

$$\frac{f(0)-f(-1)}{1}=-11 \longrightarrow 1-8(-a+1)=-11 \rightarrow a=\frac{-1}{2}$$

$x=-2a \longrightarrow \boxed{x=1}$ $\quad f'(x)=6x(x^2+1)^2\left(\frac{-1}{2}x+1\right)+(x^2+1)^3\left(\frac{-1}{2}\right)$

$f'(1)=6(2)^2(0)+(2)^3\left(\frac{-1}{2}\right)=-4$

$$\left.\begin{array}{l} \dfrac{f(\frac{\pi}{2})-f(\frac{\pi}{4})}{\frac{2\pi}{4}-\frac{\pi}{4}} = \dfrac{-1-0}{\frac{\pi}{4}} = \dfrac{-4}{\pi} \\[2ex] \dfrac{f(\frac{\pi}{2})-f(\frac{\pi}{4})}{\frac{\pi}{4}} = \dfrac{1-0}{\frac{\pi}{4}} = \dfrac{4}{\pi} \end{array}\right\} \quad \frac{\frac{-4}{\pi}}{\frac{4}{\pi}} = -1$$ ۱۰