نام و نام خانوادگی ......آتریسا جلالی...... پاسخنامه تشریحی تکلیف شماره ...۲۴... کلاس ...دوازدهم ریاضی A...

۱	$f(3)=5,\ f(0)=1 \Rightarrow m=\frac{5-1}{3-0}=\frac{4}{3} \Rightarrow \boxed{f'(3)=\frac{4}{3}}$	
۲	$f(-1)=1,\ f(2)=2 \Rightarrow m=\frac{2-1}{2-(-1)}=\frac{1}{3} \Rightarrow y-1=\frac{1}{3}(x+1) \Rightarrow y=\frac{1}{3}x+\frac{4}{3}$ $\Rightarrow \sqrt{ax-1}=\frac{1}{3}x+\frac{4}{3} \Rightarrow ax-1=\frac{(x+4)^2}{9}\ (I) \quad , \quad f'(x)=\frac{a}{2\sqrt{ax-1}}=\frac{1}{3} \Rightarrow 9a^2=4(ax-1)$ $\xrightarrow{II} ax-1=\frac{9a^2}{4} \xrightarrow{(I)} \frac{(x+4)^2}{9}=\frac{9a^2}{4} \Rightarrow x+4=\frac{9a}{2} \Rightarrow x=\frac{9a}{2}-4$ $\xrightarrow{II} a\left(\frac{9a}{2}-4\right)-1=\frac{9a^2}{4} \Rightarrow a=2 \Rightarrow f(5)=\sqrt{5(2)-1}=\boxed{3}$	
۳	$y=\frac{x^2+mx+1}{x+3} \Rightarrow y'=\frac{x^2+6x+3m-1}{(x+3)^2} \Rightarrow f'(1)=\frac{6+3m}{16}$ $4y-3x=n \Rightarrow y=\frac{3}{4}x+\frac{n}{4} \Rightarrow \boxed{y'=\frac{3}{4}}$ $\Rightarrow \frac{6+3m}{16}=\frac{3}{4} \Rightarrow \boxed{m=2}$ $y=\frac{1+2+1}{1+3}=1 \Rightarrow A(1,1) \Rightarrow 4y-3x=n \Rightarrow 4(1)-3(1)=n \Rightarrow \boxed{n=1}$ $\Rightarrow m+n=2+1=\boxed{3}$	
۴	$3g'\left(\frac{5\pi}{3}\right)-f'\left(\frac{5\pi}{3}\right)=(3g-f)'=\left(\frac{9}{3+\sin x}-\frac{27-\sin^3 x}{9-\sin^2 x}\right)'$ $=\left(\frac{9}{3+\sin x}-\frac{(3-\sin x)(9+3\sin x+\sin^2 x)}{(3-\sin x)(3+\sin x)}\right)'=\left(\frac{9-9-3\sin x-\sin^2 x}{3+\sin x}\right)'=\left(\frac{-(\sin x)(\sin x+3)}{\sin x+3}\right)'$ $=-(\sin x)'=-\cos x \xrightarrow{x=\frac{5\pi}{3}} -\cos\left(\frac{5\pi}{3}\right)=\boxed{\frac{-1}{2}}$	
۵	$g'(\sqrt[5]{3})\,f'(g(\sqrt[5]{3}))=(f\circ g)'(\sqrt[5]{3})$ $f(g(x))=f\left(\frac{1}{2x^5}\right)=-\frac{1}{\sqrt[5]{2\left(\frac{1}{2x^5}\right)}}=\frac{-1}{x^{-1}}=-x \Rightarrow (f\circ g)'(x)=(-x)'=\boxed{-1}$	

$$f(x)=\left(\frac{\sin x-1}{\sin x+1}\right)^2 \to f'(x)=2\left(\frac{\sin x-1}{\sin x+1}\right)\left(\frac{2\cos x}{(\sin x+1)^2}\right) \to f'(0)=2(-1)(2)=\boxed{-4}$$

$$f(x)=xg(x)+1 \to g(x)=\frac{f(x)-1}{x}$$

$$\lim_{x\to 0} g(x)=\lim_{x\to 0}\frac{f(x)-1}{x}=f'(0) \longrightarrow \lim_{x\to 0} g(x)=f'(0)=\boxed{-4}$$

$$y=x^2+1 \xrightarrow[\text{قرینه نسبت به محور } x]{} y=-x^2-1 \xrightarrow{y=k} -x^2-1=k \to x^2=-1-k \to x=\pm\sqrt{-1-k}\ ,\ k<-1$$

$$y'=-2x \to \begin{cases} m_1=-2\sqrt{-1-k}\ ,\ x_1=+\sqrt{-1-k} \\ m_2=2\sqrt{-1-k}\ ,\ x_2=-\sqrt{-1-k} \end{cases} \xrightarrow[\text{برهم عمودند}]{} m_1\times m_2=-1$$

$$\to -4(-1-k)=-1 \to 1+k=\frac{-1}{4} \to k=\frac{-5}{4}$$

فاصله خط d از مبدا مختصات $=|k|=\boxed{\frac{5}{4}}$

$$f(x)=2(x)^{\frac{1}{2}}(4x^2+3) \to f'(x)=2\left[\frac{1}{2}x^{-\frac{1}{2}}(4x^2+3)+x^{\frac{1}{2}}\,8x\right]=2\left[\frac{4x^2+3}{2\sqrt{x}}+8x^{\frac{3}{2}}\right]$$

$$=\frac{4x^2+3}{\sqrt{x}}+16x^{\frac{3}{2}}\ ,\quad f(a)=ma \to 2\sqrt{a}(4a^2+3)=ma \to m=\frac{2\sqrt{a}(4a^2+3)}{a}=\frac{2(4a^2+3)}{\sqrt{a}}\ \ (I)$$

$$f'(a)=m \to \frac{4a^2+3}{\sqrt{a}}+16a^{\frac{3}{2}}=m \xrightarrow{(I)} \frac{4a^2+3}{\sqrt{a}}+16a^{\frac{3}{2}}=\frac{2(4a^2+3)}{\sqrt{a}} \to 16a^{\frac{3}{2}}=\frac{4a^2+3}{\sqrt{a}}$$

$$\to 16a^2=4a^2+3 \to a=\frac{1}{2} \to m=\frac{2(4a^2+3)}{\sqrt{a}}=\frac{2(4\cdot\frac{1}{4}+3)}{\sqrt{\frac{1}{2}}}=\frac{8}{\frac{1}{\sqrt{2}}}=\boxed{8\sqrt{2}}$$

$$f(x)=\frac{\sqrt{x}}{-2x^2+x+1}\ ,\quad y=mx \to f(A)=mA \to m=\frac{f(A)}{A}=f'(A)$$

$$\frac{f(x)}{x}=\frac{\sqrt{x}}{x(-2x^2+x+1)}=\frac{1}{\sqrt{x}(-2x^2+x+1)} \to f'(x)=\frac{6x^2-x+1}{2\sqrt{x}(-2x^2+x+1)^2} \xrightarrow{f'(A)=\frac{f(A)}{A}} \frac{6A^2-A+1}{2\sqrt{A}(-2A^2+A+1)^2}$$

$$=\frac{1}{\sqrt{A}(-2A^2+A+1)}$$

$$\to \begin{cases} A=\frac{1}{2} \\ A=\frac{-1}{5} \end{cases} \xrightarrow{x\geq 0} A=\frac{1}{2} \to f\left(\frac{1}{2}\right)=\frac{\sqrt{\frac{1}{2}}}{-2(\frac{1}{2})^2+\frac{1}{2}+1}=\frac{1}{\sqrt{2}}=\boxed{\frac{\sqrt{2}}{2}}$$

$$g\left(\frac{\sqrt{5}}{2}\right)=\frac{1}{\sqrt{\frac{5}{4}-1}}=\frac{1}{\sqrt{\frac{1}{4}}}=2 \to fog\left(\frac{\sqrt{5}}{2}\right)=f(2)$$

$$x\to 2^- \Rightarrow [x]=1 \to f(x)=x^3 \to f'_-(2)=3x^2=3(2)^2=12$$

$$g(x)=(x^2-1)^{-\frac{1}{2}} \to g'(x)=\frac{-x}{(x^2-1)^{\frac{3}{2}}} \to g'\left(\frac{\sqrt{5}}{2}\right)=-4\sqrt{5}$$

$$(fog)'(x)=f'(g(x))\cdot g'(x) \to (fog)'\left(\frac{\sqrt{5}}{2}\right)=12\times(-4\sqrt{5})=-48\sqrt{5} \to \frac{(fog)'_-\left(\frac{\sqrt{5}}{2}\right)}{-48\sqrt{5}}=\boxed{1}$$