مینا جعفری پور   تکلیف ۲۴   دوازدهم دختره

۱ $(0,1)\ (3,5) \Rightarrow m=\frac{5-1}{3-0}=\frac{4}{3}\Rightarrow f'(3)=\frac{4}{3}$

۲ $(-1,1),(2,2)\Rightarrow m=f'(8)=\frac{2-1}{2-(-1)}=\frac13 \Rightarrow y-2=\frac13(x-2)\Rightarrow y=\frac13x+\frac43 \Rightarrow \sqrt{ax-1}=\frac13x+\frac43$ ریشه مضاعف باید داشته باشد

$\Rightarrow ax-1=\frac19x^2+\frac{16}{9}+\frac89x \Rightarrow \frac19x^2+(\frac89-a)x+\frac{25}{9}=0\Rightarrow \Delta=(\frac89-a)^2-4(\frac19)(\frac{25}{9})=0\Rightarrow(\frac89-a)^2=\frac{100}{81}\Rightarrow \begin{cases}\frac89-a=\frac{10}{9}\Rightarrow a=-\frac29\\ \frac89-a=-\frac{10}{9}\Rightarrow a=2\end{cases}$

$a=-\frac29\Rightarrow f'(x)=\frac{a}{2\sqrt{ax-1}}=\frac{-\frac29}{2\sqrt{-\frac29x-1}}\neq\frac13$ همیشه منفی است غ ق ق

$a=2\Rightarrow \frac{2}{2\sqrt{2x-1}}=\frac13\Rightarrow x=5\Rightarrow \boxed{f(5)=3}$

۳ $4y-3x=n\Rightarrow y=\frac34x+\frac n4 \Rightarrow \frac{1+m+1}{4}=\frac34+\frac n4\Rightarrow 2+m=3+n\Rightarrow m=n+1$

$y'=\frac{(2x+m)(x+3)-(x^2+mx+1)}{(x+3)^2}\Rightarrow\frac{(2+m)(4)-(2+m)}{16}=\frac34\Rightarrow 8+4m-2-m=12=3m+6\Rightarrow m=2\Rightarrow n=1\Rightarrow \boxed{m+n=3}$

۴ $3g(x)=\frac{9}{3+\sin x}$ $\quad f(x)=\frac{(3-\sin x)(9+\sin^2x+3\sin x)}{(3-\sin x)(3+\sin x)}=\frac{\sin^2x+3\sin x+9}{3+\sin x}\Rightarrow h(x)=3g(x)-f(x)=-\frac{(\sin^2x+3\sin x)}{3+\sin x}$

$=-\sin x\Rightarrow h'(x)=-\cos x\Rightarrow h'(\frac{5\pi}{3})=\boxed{-\frac12}$

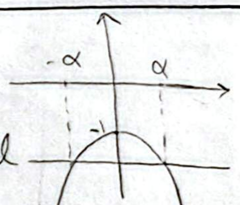
۵ $fog(x)=-\frac{1}{\sqrt[5]{\frac{1}{x^5+|x^5|}+\left|\frac{1}{x^5+|x^5|}\right|}}\overset{\sqrt[5]{3}>0}{=}\frac{-1}{\sqrt[5]{\frac{1}{2x^5}+\frac{1}{2x^5}}}=\frac{-1}{\sqrt[5]{\frac{1}{x^5}}}=-x\Rightarrow(fog(\sqrt[5]{3}))'=\boxed{-1}$

۶ $f'(0)=\lim_{x\to0}\frac{xg(x)+1-1}{x-0}=\lim_{x\to0}g(x)$

$f'(x)=2\left(\frac{\sin x-1}{\sin x+1}\right)\left(\frac{2}{(\sin x+1)^2}\right)\times\cos x\Rightarrow f'(0)=2\times-1\times2\times1=\boxed{-4}$

۷ $y=x^2+1 \xrightarrow{\text{قرینه نسبت به محور x}} y=-x^2-1\Rightarrow y'=-2x \Rightarrow (-2\alpha)(-2(-\alpha))=-4\alpha=-1\Rightarrow\alpha^2=\frac14\Rightarrow\alpha=\pm\frac12$

$\Rightarrow|y|=|-\frac14-1|=|-\frac54|=\boxed{\frac54}$



۸ $f(x)=2\sqrt x(4x^2+3)\Rightarrow f(b)=2\sqrt b(4b^2+3)=ab$

$d: y=ax$ $\quad\Rightarrow \frac{f(b)}{f'(b)}=b=\frac{8\sqrt b\, b^2+6\sqrt b}{20\sqrt b\, b+\frac{3\sqrt b}{b}}=\frac{8b^2+6}{20b+\frac3b}$

$f'(x)=\frac{1}{\sqrt x}(4x^2+3)+8x(2\sqrt x)\Rightarrow f'(b)=\frac{1}{\sqrt b}(4b^2+3)+16b\sqrt b=a$

$\Rightarrow 8b^2+6=20b^2+3\Rightarrow 12b^2=3\Rightarrow b^2=\frac14\Rightarrow b=\pm\frac12$ $\quad D_f:[0,+\infty)\Rightarrow f'(\frac12)=\sqrt2(4)+16(\frac12)(\frac{1}{\sqrt2})=\boxed{8\sqrt2}=a$

۹

۱۰ $f \circ g(x) = \left(\frac{1}{\sqrt{x^2-1}}\left[\frac{1}{\sqrt{x^2-1}}\right]\right)^3$

$$\lim_{x \to \left(\frac{\sqrt{5}}{2}\right)^-} \frac{\left(\frac{1}{\sqrt{x^2-1}}[2^+]\right)^3 - (2\times 2)^3}{x - \frac{\sqrt{5}}{2}} \overset{\frac{0}{0}}{\underset{H\circ p}{=}} \frac{3\left(\frac{2}{\sqrt{x^2-1}}\right)^2 \times \frac{-2x\times 2}{2\sqrt{x^2-1}} \times \frac{1}{x^2-1}}{1} = \frac{-16\sqrt{5}}{1.1.8}$$