نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ..... کلاس .....

۱

$A\left|\begin{matrix}2\\3\end{matrix}\right.$ $B\left|\begin{matrix}0\\1\end{matrix}\right.$ $\frac{\Delta y}{\Delta x}=\left(\frac{2}{3}\right)=f'(2)$

۲

$\frac{\Delta y}{\Delta x}=f'(A)=\frac{2-1}{2-(-1)}=\frac{1}{3}$ معادله خط‌المماس $=\frac{1}{3}x+\frac{2}{3}$

۳

$y'=\frac{x^2+6x+3m-1}{(x+3)^2}\to\left|\begin{matrix}1 & m\\ 0 & 1\end{matrix}\right|=2$

$x=1\to\frac{3}{4}=\frac{6+3m}{16}\to m=2\to A\left|\begin{matrix}1\\1\end{matrix}\right.$ $m+n=3$

۴

$f(x)=\frac{(x-5)(9+5x^2+x^3)}{(x-5)(x^2+6)}$ $=f(\sin x)=\sin' x\left(\frac{9+x^2+x^3}{x^2+x}\right)'\cos x\frac{x^2+6x}{(x^2+x)^2}$

$g(\sin x)=\sin' x\left(\frac{x}{x^2+x}\right)'=\cos x\frac{-x^2}{(x^2+x)^2}$

$3g'\left(\frac{x}{3}\right)-f'\left(\frac{x}{3}\right)=\frac{\cos x}{(x^2+x)^2}\left(-x^2+6x\right)=-\cos x\frac{x(x-6)}{x^2(x+1)^2}=-\frac{1}{2}$

۵

$fog\xrightarrow{x\to 0}\frac{-1}{3\sqrt{\frac{x^2+1}{x^2+3}}}=-x$ $\to(fog)'=-1$

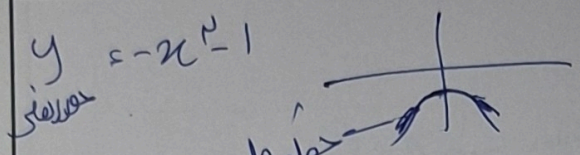
$f(x)=x\,g(x)+1 \to g(x)=\frac{f(x)-1}{x} \to \lim_{x\to 0} g(x)=\frac{0}{0} \xrightarrow{\text{hop}} \frac{+f'(0)}{1}=f'(0)$

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

$\to f'(0)=2\times\left(\frac{2}{1}\right)\times(-1)=-4$

۵)

$y=-x^2-1$ معادله



حول طاسی عمودیم

$\to$ یکی از ۴ وتری از مبدا $y'=-2x \xrightarrow{x=\pm\frac{1}{2}} \pm\frac{1}{2}$

$-x^2-1=d$

$x=\pm\frac{1}{2} \to -\frac{1}{4}-1=-\frac{5}{4}=d$

$\to$ جواب سوال $=-\frac{5}{4}$ ✓ ۳)

۶)

$f(a)=m$ مشتق $\to$ 10 $\to$ $\frac{1}{\sqrt{x}}(4x^2+3x)+2\sqrt{x}(8x)=0$ $\to$ 10 طبق فرض

$f(x)=2\sqrt{x}(2x^2+3)=8x^2\sqrt{x}+6\sqrt{x} \to f'(x)=16x\sqrt{x}+\frac{3}{\sqrt{x}}=\frac{16x^2+3}{\sqrt{x}}$

$y-2\sqrt{\alpha}(2\alpha^2+3)=\frac{16\alpha^2+3}{\sqrt{\alpha}}(x-\alpha) \xrightarrow{(0,0)} -2\sqrt{\alpha}(2\alpha^2+3)=\frac{16\alpha^2+3}{\sqrt{\alpha}}(-\alpha)$

$\to 2(2\alpha^2+3)=16\alpha^2+3 \to 12\alpha^2=3 \to \alpha^2=\frac{1}{4} \to m=\frac{16\left(\frac{1}{4}\right)+3}{\sqrt{\frac{1}{4}}}=8\sqrt{2}$

۷)

d خط $\to y=ax$ $\quad A(\alpha,a\alpha)$

$f(\alpha)=\frac{\sqrt{\alpha}}{-2\alpha^2+\alpha+1}=a\alpha \to a\sqrt{\alpha}(-2\alpha^2+\alpha+1)=1 \to -2a\alpha^{\frac{5}{2}}+a\alpha^{\frac{1}{2}}+a\alpha^{\frac{3}{2}}=1$

$\xrightarrow{\text{مشتق}} -5a\alpha^{\frac{3}{2}}+\frac{3}{2}a\alpha^{\frac{1}{2}}+\frac{1}{2}a\alpha^{-\frac{1}{2}}=0 \xrightarrow[\times 2\sqrt{\alpha}]{\div a} -10\alpha^2+3\alpha+1=0 \to \begin{cases}\alpha=-\frac{1}{5}\\ \alpha=\frac{1}{2}\end{cases}$

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

۸)

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

$(2x)^2 \quad (fog(\frac{\sqrt{5}}{2}))'=g'(\frac{\sqrt{5}}{2})^{-}\times f'(g(\frac{\sqrt{5}}{2})^{-})$

$-2\sqrt{5}\times 4\times 5=-120\sqrt{5} \xrightarrow{\div -24\sqrt{5}} \frac{120}{24}=5$ ۴/۵

$g(x)=(x^2-1)^{-\frac{1}{2}} \to g'(x)=-\frac{1}{2}(x^2-1)^{-\frac{3}{2}}\times 2x \to g'(\frac{\sqrt{5}}{2}^{-})=\frac{1}{\sqrt{(\frac{\sqrt{5}}{2})^2-1}^3}=\frac{1}{\sqrt{(\frac{1}{2})^3}}=\frac{1}{(\frac{1}{2})^3}=8$

$f'(4)=((2x)^2)'=(4x^2)'=8x=8\times 4 \to g'(\frac{\sqrt{5}}{2}^{-})\times f'(g(\frac{\sqrt{5}}{2})^{-})=-4\sqrt{5}\times 8\times 4 \to \frac{32\times 4\times(-4\sqrt{5})}{-32\sqrt{5}}=8$