نام و نام خانوادگی ......[illegible]...... ۱۸ پاسخنامه تشریحی تکلیف شماره ۲۴... کلاس ...یازدهم تجربی A......

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$f'(3) = m_{\text{خط}} \Rightarrow \begin{matrix}(0,1)\\(3,5)\end{matrix} \Rightarrow \frac{5-1}{3-0} = \frac{4}{3} \Rightarrow f'(3) = \frac{4}{3}$

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$m_{\text{خط}} = \frac{2-1}{2-(-1)} = \frac{1}{3} \xrightarrow[(-1,+1)]{\text{معادله خط}} y-1 = \frac{1}{3}(x+1) \Rightarrow y = \frac{1}{3}x + \frac{4}{3}$

مماس $\xrightarrow[\Delta=0]{\text{معادله تلاقی}} \sqrt{ax-1} = \frac{1}{3}x + \frac{4}{3} \Rightarrow 9ax - 9 = x^2 + 8x + 16$

$x^2 + (8-9a)x + 25 = 0 \Rightarrow \Delta = (8-9a)^2 - 4(25) = 0$

$8 - 9a = 10 \Rightarrow a = -\frac{2}{9} \xrightarrow{f(5)} \sqrt{-\frac{10}{9} - 1} =$ غ ق ق

$8 - 9a = -10 \Rightarrow a = 2 \xrightarrow{f(5)} \sqrt{2 \times 5 - 1} = \sqrt{9} = \boxed{3}$

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

$m_{\text{خط}} \Rightarrow 4y = 3x + n \Rightarrow y = \frac{3}{4}x + \frac{n}{4} \Rightarrow m_{\text{خط}} = \frac{3}{4}$ (شیب)

$y = \frac{x^2+2x+1}{x+3} \xrightarrow{x=1} y = \frac{1+2+1}{4} = 1 \Rightarrow (1,1) \rightarrow$ در هر دو صدق می‌کند

$\Rightarrow 4y - 3x = n \xrightarrow{(1,1)} 4-3 = \boxed{1 = n}$ $\Rightarrow m+n = 2+1 = \boxed{3}$

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$f(x) = \frac{27 - \sin^3 x}{9 - \sin^2 x} = \frac{\cancel{(3-\sin x)}(9 + \sin^2 x + 3\sin x)}{\cancel{(3-\sin x)}(3+\sin x)} = \frac{\sin^2 x + 3\sin x + 9}{3 + \sin x}$

$3g'\left(\frac{5\pi}{3}\right) - f'\left(\frac{5\pi}{3}\right) = (3g-f)'\left(\frac{5\pi}{3}\right)$

$(3g-f)(x) = \frac{\cancel{9} - \sin^2 x - 3\sin x - \cancel{9}}{3 + \sin x} = -\sin x \Rightarrow (3g-f)'(x) = -\cos x$

$(3g-f)'\left(\frac{5\pi}{3}\right) = -\cos\frac{5\pi}{3} = \boxed{-\frac{1}{2}}$

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$g'(\sqrt[5]{2})\, f'(g(\sqrt[5]{2})) = (fog)'(\sqrt[5]{2})$

$\underset{x>0}{fog(x)} = \frac{-1}{\sqrt[5]{\cancel{\frac{1}{2x^5} + \frac{1}{2x^5}}\ \frac{2}{2x^5}}} = \frac{-1}{\frac{1}{x}} = -x \Rightarrow (fog)'(x) = -1$

$(fog)'(\sqrt[5]{2}) = \boxed{-1}$

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$\underset{x>0}{g(x)} = \frac{1}{2x^5}$

$f(x) = x\,g(x)+1 \Rightarrow g(x) = \frac{f(x)-1}{x}$

$\lim_{x\to 0} g(x) = \lim_{x\to 0} \frac{f(x)-1}{x} = \lim_{x\to 0} \frac{\left(\frac{-1+\sin x}{1+\sin x}\right)^2-1}{x} \xrightarrow{\text{شکلی}} \frac{\left(\frac{x-1}{x+1}\right)^2-1}{x} = \frac{\frac{\cancel{x^2}-2x+\cancel{1}-\cancel{x^2}-2x-\cancel{1}}{x^2+2x+1}}{x}$ ۶

$= \frac{-4x}{x(x^2+2x+1)} = \frac{-4}{(x+1)^2} \overset{x=0}{=} \boxed{-4}$ ✓ ۲

"قرینه نسبت به محور x" $\rightarrow$ y قرینه $\Rightarrow -y = x^2+1 \Rightarrow y = -x^2-1$, $y=K$ $\Big) \rightarrow K = -x^2-1 \Rightarrow x^2 = -K-1$

$x = \pm\sqrt{-K-1}$

$y' = -2x \longrightarrow x = +\sqrt{-K-1} \Rightarrow y' = -2\sqrt{-K-1}$ ۷

$\quad\;\, \longrightarrow x = -\sqrt{-K-1} \Rightarrow y' = +2\sqrt{-K-1}$ $\Big) \xrightarrow[\text{حاصلضرب} = -1]{\text{عمود}} -4(-K-1) = -1$ ۲

$(-1 > K)$ $\quad -K-1 = \frac{1}{4}$

$-K = \frac{5}{4} \rightarrow K = -\frac{5}{4}$ ✓

$\Rightarrow y = -\frac{5}{4} \xrightarrow{\text{طول از مبدا}} \boxed{\frac{5}{4}}$ ✓

$f(x)$ از مبدا می‌گذرد ، خط d $\Rightarrow (0,0)$: نقطه تقاطع $\Rightarrow f'(0) =$ شیب خط ۱

$f'(x) = \frac{\cancel{2}}{\cancel{2}\sqrt{x}}(4x^2+3) + 2\sqrt{x}(8x) \Rightarrow f'(0) = \frac{1}{0}(3)+0 = \text{ت.ن} \rightarrow$ موازی محور yها

$\underline{\quad}$ ت.ن

$f(x) = 2\sqrt{x}(4x^2+3) = 8x^2\sqrt{x}+6\sqrt{x} \longrightarrow f'(x) = 20x\sqrt{x}+\frac{3}{\sqrt{x}} = \frac{20x^2+3}{\sqrt{x}}$ $\quad m = \frac{20\left(\frac{1}{4}\right)+3}{\sqrt{\frac{1}{2}}} = 8\sqrt{2}$ ۸

پس خط $\rightarrow x=0 \rightarrow$ | شیب = تعریف نشده

$y - 2\sqrt{\alpha}(4\alpha^2+3) = \frac{20\alpha^2+3}{\sqrt{\alpha}}(x-\alpha) \xrightarrow{(0,0)} -2\sqrt{\alpha}(4\alpha^2+3) = \frac{20\alpha^2+3}{\sqrt{\alpha}}(-\alpha) \longrightarrow 2(4\alpha^2+3) = 20\alpha^2+3 \longrightarrow 12\alpha^2 = 3 \longrightarrow \alpha^2 = \frac{1}{4}$

خط $d \Rightarrow y = Kx$

$f(x) = \frac{\sqrt{x}}{-2x^2+x+1}$ $\Big\} \Rightarrow Kx = \frac{\sqrt{x}}{-2x^2+x+1} \Rightarrow K = \frac{1}{\sqrt{x}(-2x^2+x+1)}$ $\quad f\left(\frac{1}{2}\right) = \frac{\frac{\sqrt{2}}{2}}{-\frac{1}{2}+\frac{1}{2}+1} = \boxed{\frac{\sqrt{2}}{2}}$ ✓

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شیب $\rightarrow y' = K$ ۹

$f'(x) = \frac{\frac{1}{2\sqrt{x}}(-2x^2+x+1) - \sqrt{x}(-4x+1)}{(-2x^2+x+1)^2} = \frac{-2x^2+x+1+8x^2-2x}{2\sqrt{x}(-2x^2+x+1)^2} = \frac{6x^2-x+1}{2\sqrt{x}(-2x^2+x+1)^2}$ $\Big\} \Rightarrow$

$K = \frac{6x^2-x+1}{2\sqrt{x}(-2x^2+x+1)^2} = \frac{1}{\sqrt{x}(-2x^2+x+1)} \Rightarrow 6x^2-x+1 = -4x^2+2x+2$

$10x^2-3x-1 = 0 \Rightarrow x = \frac{3\pm\sqrt{9+40}}{20}$ $\rightarrow \frac{1}{2}$; $\rightarrow -\frac{1}{4}$ غ ق ق

$fog(x) = \left(\frac{1}{\sqrt{x^2-1}}\left[\frac{1}{\sqrt{x^2-1}}\right]\right)^2 \Rightarrow fog(x) = \left(\frac{2}{\sqrt{x^2-1}}\right)^2 = \frac{4}{x^2-1} = 4(x^2-1)^{-1}$

$\left(fog\left(\frac{\sqrt{5}}{2}\right)\right)' = g'\left(\frac{\sqrt{5}}{2}^-\right) \times f'\left(g\left(\frac{\sqrt{5}}{2}^-\right)\right)$ ۱۰

$x < \frac{\sqrt{5}}{2} \Rightarrow x^2 < \frac{5}{4} \Rightarrow x^2-1 < \frac{1}{4} \Rightarrow \sqrt{x^2-1} < \frac{1}{2} \Rightarrow \frac{1}{\sqrt{x^2-1}} > 2 \Rightarrow \left[\frac{1}{\sqrt{x^2-1}}\right] = 2$ ۱

$\Rightarrow (fog)'(x) = -4(x^2-1)^{-2}(2x) \xrightarrow{x=\frac{\sqrt{5}}{2}} -4\left(\frac{1}{4}\right)^{-2}\left(2\times\frac{\sqrt{5}}{2}\right) = -4\times 16\times\sqrt{5} = -64\sqrt{5}$

$\Rightarrow \frac{-64\sqrt{5}}{-48\sqrt{5}} = \boxed{\frac{4}{3}}$ $\quad g(x) = (x^2-1)^{-\frac{1}{2}} \rightarrow g'(x) = \frac{-1}{2}(x^2-1)^{-\frac{3}{2}} \times 2x \rightarrow g'\left(\frac{\sqrt{5}}{2}^-\right) = \frac{1}{\sqrt{\left(\frac{5}{4}\right)^- - 1}} = \frac{1}{\sqrt{\left(\frac{1}{4}\right)^-}} = \frac{1}{\left(\frac{1}{2}\right)^-} = 2^+$

$f'(2^+) = ((2x)^3)' = (8x^3)' = 24x^2 = 24\times 4$

$\rightarrow g'\left(\frac{\sqrt{5}}{2}^-\right) \times f'\left(g\left(\frac{\sqrt{5}}{2}^-\right)\right) = -4\sqrt{5}\times 4\times 24 \longrightarrow \frac{24\times 4\times(-4\sqrt{5})}{-48\sqrt{5}} = 8$