«ضمیمه کلاس ریاضی» «دوازدهم دفتر A» تکلیف شماره ۱۴

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

(2) $m = \frac{2-1}{2-(-1)} = \frac{1}{3} \rightarrow \sqrt{ax-1} = \frac{1}{3}x + \frac{4}{3} \rightarrow ax - 1 = \frac{1}{9}(x^2 + 8x + 16)$

$\frac{1}{3}x + \frac{4}{3}$ //

$9ax - 9 = x^2 + 8x + 16 \rightarrow x^2 + (8-9a)x + 25 = 0 \rightarrow \Delta = 0$

$(8-9a)^2 - 4(25) = 0 \rightarrow a = -\frac{2}{9} \rightarrow f(x) = \sqrt{-\frac{2}{9}x - 1} \rightarrow f(5) =$ غ ق ق

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

(3) $\lim_{x\to1} \frac{f(x)-f(1)}{x-1} \xrightarrow{HOP} \lim_{x\to1} \frac{f'(x)}{1} \rightarrow \frac{(\overset{2+m}{2x+m})(\overset{4}{x+3}) - (x^2+\overset{2+m}{mx}+1)(1)}{(x+3)^2}$

$\rightarrow \frac{8+4m-2-m}{16} \rightarrow \frac{6+3m}{16} = \frac{3}{4} \rightarrow 6+3m = 12 \rightarrow \boxed{m=2}$

$y = \frac{3}{4}x + \frac{n}{4} \rightarrow \boxed{n=1} \qquad \boxed{m+n=3}$

$f(1) = \frac{4}{4} = 1$

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

(5) $(fog)' \xrightarrow[x>0\ \text{ازاء}]{} \quad f(x) = \frac{-1}{\sqrt[5]{2x}} \quad g(x) = \frac{1}{2x^5} \Rightarrow fog\ \frac{-1}{\sqrt[5]{2\frac{1}{2x^5}}}$

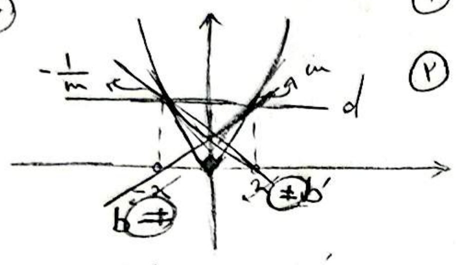
$\rightarrow fog(x) = \frac{-1}{\frac{1}{x}} \rightarrow fog(x) = -x \rightarrow (fog)'(9\sqrt{3}) = -1$

(۶) $\lim_{x\to 0}(g(x)) \quad f(x)=x\,g(x)+1 \to g(x)=\frac{f(x)-1}{x} \to \frac{\left(\frac{\sin x-1}{\sin x+1}\right)^2-1}{x}$

$\xrightarrow{\text{هم‌ارزی}} \frac{\left(\frac{x-1}{x+1}\right)^2-1}{x} \to \frac{\frac{x^2-2x+1-x^2-2x-1}{x^2+2x+1}}{x} \to \frac{-4\cancel{x}}{(x^2+2x+1)(\cancel{x})} \to$

$\lim_{x\to 0} \to \frac{-4}{(0+0+1)} = \boxed{-4}$

(۷)



① $mx+b = x^2+1 = d$

② $+\frac{x}{m}+b = x^2+1 = d$

$\to \frac{x}{m} = mx \to x = m^2 x \to \boxed{m^2=1}$

$\to 1)\ \boxed{m=+1}$ ، $m=-1$ غق

$\boxed{-b'=+b}$

$b+x = x^2+1$

$b'-x = x^2+1$

$\to b'+x = -x+b' \to 2x = b'-b = d \to 2x=2b' \to \boxed{x=b'}$

(۸) $y=ax \to \underset{\text{مشتق}}{2\sqrt{x}}(4x^2+3) = ax \to 4x^2+3 = \frac{ax}{2\sqrt{x}} \xrightarrow{①} 16x^4+24x^2+9 = \frac{a^2x^2}{4x}\ (I)$

② $\frac{4x+3}{\sqrt{x}} + 2\sqrt{x}(8x) \Rightarrow a = \frac{20x^2+3}{\sqrt{x}} \xRightarrow{(I)} \frac{20x^2+3}{\sqrt{x}} = \frac{2\sqrt{16x^4+24x^2+9}}{\sqrt{x}}$

$\to 336x^4+24x^2-27 \to 112x^4+8x^2-9 \to \left(x^2-\underset{\frac{28}{112}=\frac14}{28}\right)(\cancel{x^2+36}) \to x^2=\frac14 \to x=\pm\frac12$ غق

$4\sqrt{2} = \frac12 a \to \boxed{a=8\sqrt{2}}$

(۹) $f(x)=\frac{\sqrt{x}}{-2x^2+x+1}$, $y=ax \to \frac{\sqrt{x}}{\frac{-2x^2+x+1}{(x-1)(2x+1)}} = ax \to \left((x-1)(2x+1)\right)^2 a^2x^2 = x$

(۱۰) $g(x)=\frac{1}{\sqrt{x^2-1}} \Rightarrow g'(x) = \frac{0-\frac{2x}{2\sqrt{x^2-1}}}{x^2-1} = \frac{-x}{(x^2-1)\sqrt{x^2-1}} \to g'\left(\frac{\sqrt5}{2}\right) = \frac{-\frac{\sqrt5}{2}}{\frac14\times\frac12} = -4\sqrt5$

$f(x) = (x[x])^3 \Rightarrow f'(x) = 3(x[x])^2[x] \to x \to \left(\frac{\sqrt5}{2}\right)^- = \frac{1}{\sqrt{\frac{5^-}{4}-1}} = \frac{1}{\sqrt{\frac14^-}} = \frac{1}{\frac12^-} = 2^+$

$g'\left(\frac{\sqrt5}{2}\right) f'\left(g\left(\frac{\sqrt5}{2}\right)^-\right) = (-4\sqrt5)\,f'(2^+) = -4\sqrt5 \times 3(4)^2 \times 2 = (-48\sqrt5)(8) \to \boxed{8}$