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

۱

$y = ax + b \to b = 1$

$y = ax + 1 \longrightarrow 2a + 1 = 5 \longrightarrow a = \frac{4}{2}$

$f'(2) = a \longrightarrow f'(2) = \frac{4}{2}$

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$f(x) = \sqrt{ax - 1} \longrightarrow f'(x) = \frac{a}{2\sqrt{ax+1}}$

$y = mx + b \longrightarrow m = \frac{\Delta y}{\Delta x} \longrightarrow \boxed{\frac{1}{2} = m}$

$y = \frac{1}{2}x + b \to 2 = \frac{2}{2} + b \to \boxed{b = \frac{4}{2}}$

$y = \frac{1}{2}x + \frac{4}{2} \xrightarrow{x=a} y = \frac{a}{2} + \frac{4}{2} = 2 \longrightarrow \boxed{f(a) = 2}$

۳

$2y - 2x = n \longrightarrow y = 2x + \frac{n}{2} \longrightarrow f'(1) = 2$

$f(x) = \frac{x^2 + mn + 1}{x + 2} \longrightarrow f'(x) = \frac{(2x + m)(x+2) - (x^2 + mn + 1)}{(x+2)^2} \to f'(1) = \frac{8 + 2m - 2 - m}{16}$

$\to \frac{2m + 4}{16} = \frac{2}{4} \to \boxed{m = 2}$

$\boxed{n + m = 3}$

$f(x) = \frac{x^2 + 2x + 1}{x + 2} \longrightarrow f(1) = 1 \longrightarrow 1 = \frac{2}{4} + \frac{n}{4} \to \boxed{n = 1}$

۴

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

$g(x) = \frac{2}{2 + \sin x} \longrightarrow 2g(x) - f(x) = h(x) \to \frac{4 - 4 - \sin^2 x - 2\sin x}{4 + 2\sin x} = \frac{-\sin x(2 + \sin x)}{2 + \sin x}$

$h(x) = -\sin x \longrightarrow h'(x) = -\cos x \longrightarrow h'(\frac{5\pi}{2}) = -\cos(\frac{5\pi}{2}) \to \boxed{h'(\frac{5\pi}{2}) = -1}$

۵

$g'(x) \cdot f'(g(x)) = (fog(x))' \cdot (f(g(x)))'$ ← $x > 0$ چون باید در دامنه باشد.

$fog(x) = \frac{-1}{\sqrt[5]{\frac{1}{x^5 + 1x^0 1}} + \left|\frac{1}{x^5 + 1x^0 1}\right|} \xrightarrow{x>0} \frac{-1}{\sqrt[5]{\frac{2}{2x^5}} + \frac{-1}{\frac{1}{x}}} = -x$

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

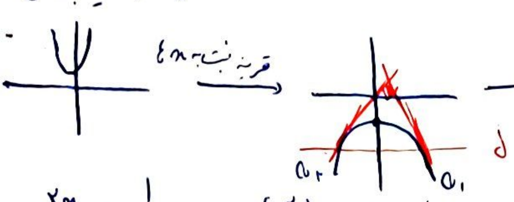
$f(x) = \left(\frac{-1+\sin x}{1+\sin x}\right)^2 , \; x(g(x)+1$

$f(x) = x(g(x)) + 1 \longrightarrow f'(x) = x(g'(x)) + g(x) \xrightarrow{x\to 0} f'(0) = g(0)$

$f'(x) = 2\left(\frac{-1+\sin x}{1+\sin x}\right)\left(\frac{2\cos x}{(1+\sin x)^2}\right) \to f'(0) = (-2)(2) = -4$ ۶

$f'(0) = -4 \to g(0) = -4$

شیب d = 0



ضابطه جدید: $f(x) = -x^2-1 \longrightarrow f'(x) = -2x$

پس باید شیب ۲ خط a_1, a_2 قرینه و معکوس یکدیگر باشند ۷

$-2x = \frac{1}{2(-x)} \to 4x^2 = 1 \to x = \pm\frac12$

و x به ازای $x = -\frac12$ و $x = \frac12$ بین گزینه‌ات

$y = -(\frac12)^2 - 1 \longrightarrow y = -\frac54 \xrightarrow{\text{فاصله از مبدأ}} \frac54$

$d \Rightarrow y = mx \xrightarrow{x=a} y = ma$

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

$\to \frac{20x^2+3}{\sqrt{x}} \to \frac{20x^2+3}{\sqrt{x}} \xrightarrow{x=a} \boxed{\frac{20a^2+3}{\sqrt{a}} = m} \to I \to m\sqrt{a} = 20a^2+3$ ۸

$f(x) = 2\sqrt{x}(4x^2+3) \xrightarrow{x=a} 8a^2\sqrt{a}+6\sqrt{a} = ma \to \sqrt{a}(8a^2+6) = (m\sqrt{a})\sqrt{a} \to \boxed{8a^2+6 = m\sqrt{a}} \to II$

$\to I, II \to 20a^2+3 = 8a^2+6 \to 12a^2 = 3 \to a = \pm\frac12 \xrightarrow{a>0} \boxed{+\frac12} \to a$

$\frac{\sqrt2}{2} m = 8 \to \boxed{m = 8\sqrt2}$

$f(x) = \frac{\sqrt{x}}{-2x^2+x+1} \to f'(x) = \frac{\frac{1}{2\sqrt{x}}(-2x^2+x+1) - \sqrt{x}(-4x+1)}{(-2x^2+x+1)^2}$

$d \to y = mx \xrightarrow{x=a} ma$

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

$6a^2-a+1 = 2(-2a^2+a+1)$ ۹

$6a^2-a+1 = -4a^2+2a+2$

$\frac{\sqrt{a}}{-2a^2+a+1} = ma \to m\sqrt{a}(-2a^2+a+1) = 1 \to II$

$10a^2-3a-1 = 0$

$\to a>0 \to \boxed{a = \frac12}$

$\frac{\sqrt2}{2} m\left(-\frac12+\frac12+1\right) = 1 \to \boxed{m = \sqrt2} \to y = ma \to \boxed{y = \frac{\sqrt2}{2}}$

$(f\circ g(x))' = f'(g(x))\cdot g'(x) \longrightarrow (f\circ g(x))' = f'(2)\cdot -4\sqrt5 \to 12\cdot -4\sqrt5 = \boxed{-48\sqrt5}$

$\boxed{\frac{-48\sqrt5}{-48\sqrt5} = 1}$ ۱۰

$g'(x) = \frac{-x}{(x^2-1)(\sqrt{x^2-1})} \to g'\left(\frac{\sqrt5}{2}\right) = -4\sqrt5$

$g(x) = \frac{1}{\sqrt{x^2-1}} \to g\left(\frac{\sqrt5}{2}\right) = 2$

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

مشتق چپ $(x=2)$ ← براکت برابر با یک

$f'(2^-) = 12$