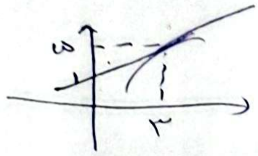
نام و نام خانوادگی ......[illegible]...... پاسخنامه تشریحی تکلیف شماره ...۲۴... کلاس ......دوازدهم دختر ۸

۱

$f'(3) = \frac{5-1}{3} = \frac{4}{3}$



۲

$f'(8) = \frac{1}{3}$ $\quad y-1 = \frac{1}{3}(x+1) \Rightarrow y = \frac{1}{3}x + \frac{4}{3}$

$\sqrt{ax-1} = \frac{1}{3}x + \frac{4}{3} \Rightarrow 9ax - 9 = x^2 + 8x + 16 \Rightarrow x^2 + (8-9a)x + 25$

$8 - 9a = 10 \Rightarrow a = -\frac{2}{9}$ $\quad f(5) = 3$

$8 - 9a = -10 \Rightarrow a = 2$

۳

$f'(1) = \frac{3}{4}$ $\quad f'(x) = \frac{(2x+m)(x+3) - (x^2+mx+1)}{(x+3)^2} = \frac{8+4m-2-m}{16}$

$\frac{6+3m}{16} = \frac{3}{4}$ $\quad m = 2$ $\quad f(x) = \frac{x^2+2x+1}{x+3}$ $\quad f(1) = 1$ $\quad n = 1$ $\quad \boxed{m+n=3}$

$y - 1 = \frac{3}{4}(x-1) \Rightarrow \frac{3}{4}x + \frac{1}{4} = y \Rightarrow 3x + 1 = 4y$

۴

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

$\xrightarrow{\ '\ } -\cos x \Rightarrow (3g' - f')_{(\frac{5\pi}{3})} = \frac{-1}{2}$

۵

$\left(f(g(\frac{5\pi}{2}))\right)' \Rightarrow \frac{-1}{\sqrt[5]{\frac{1}{x^5+1x^{51}} + \frac{1}{x^5+x^{51}}}} = \frac{-1}{\sqrt[5]{\frac{2}{2x^5}}} = -x$

-1

۶
$$\lim_{x\to 0} g(x) = \frac{\left(\frac{-1+\sin x}{1+\sin}\right)^2 - 1}{x} \underset{Hop}{\overset{0/0}{=}} \frac{2\left(\frac{\cos x(1+\sin) - \cos(-1+\sin)}{(1+\sin)^2}\right)\left(\frac{-1+\sin}{1+\sin}\right)}{1}$$

$\boxed{-4}$

۷

۸
$$f'(x) = \frac{1}{\sqrt{x}}(4x^2+3) + 16x\sqrt{x} = \frac{f(x)}{x} = \frac{2\sqrt{x}(4x^2+3)}{x}$$

شیب خط مماس $= \dfrac{f(x)-0}{x}$ $\qquad \dfrac{20x^2+3}{\cancel{\sqrt{x}}} = \dfrac{2\sqrt{x}(4x^2+3)}{\cancel{x}}$ $\qquad$ شیب $= 8\sqrt{2}$

$$20x^2+3 = 8x^2+6 \Rightarrow 12x^2-3 \Rightarrow x = \pm\frac{1}{2} \Rightarrow +\frac{1}{2}$$

۹
$$f'(x) = \frac{\frac{1}{2\sqrt{x}}(-2x^2+x+1) + (+4x-1)\sqrt{x}}{\cancel{(-2x^2+x+1)^2}\,(-2x^2+x+1)} = \frac{\sqrt{x}}{\cancel{(-2x^2+x+1)}\,x}$$

شیب $= \dfrac{f(x)-0}{x}$

$$\frac{\overset{6x^2-x+1}{\cancel{-2x^2+x+1+8x^2-2x}}}{2\cancel{\sqrt{x}}\,(-2x^2+x+1)} = \frac{1}{\cancel{\sqrt{x}}}$$

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

$10x^2-3x-1$

$\left(x-\frac{5}{10}\right)\left(x+\frac{2}{10}\right)$ $\qquad x = \frac{1}{2}$ ✓ $\quad -\frac{2}{10}$

$\boxed{f\left(\frac{1}{2}\right) = \frac{\sqrt{2}}{2}}$

۱۰
$$g'\left(\frac{\sqrt{5}}{2}\right) \times f'\left(g\left(\frac{\sqrt{5}}{2}\right)\right) = -48\sqrt{5}$$

$f'(2) \Rightarrow x^3 \Rightarrow 3x^2$

$\dfrac{-\sqrt{5}}{4\times\frac{1}{4}\times\frac{1}{4}} = -4\sqrt{5}$ $\qquad 2$ $\qquad 3\times 4 = 12$

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