دوازدهم تجربی

تکلیف شماره ۲۶

به نام آنکه جان را فکرت آموخت

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(۱)

$d: y = ax+b \xrightarrow{b=1} y = ax+1 \to \left|\begin{matrix}3\\5\end{matrix}\right. \to 5 = 3a+1 \to a = \frac{4}{3}$

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

(۲)

$m = \frac{2-1}{2-(-1)} = \frac{1}{3} \to y = \frac{x}{3}+b \to 1 = -\frac{1}{3}+b \to b = \frac{4}{3}$

$y = \frac{x}{3}+\frac{4}{3}$

$\frac{1}{3}x + \frac{4}{3} = \sqrt{ax-1} \to x+4 = 3\sqrt{ax-1}$

$-\frac{1}{3} = \frac{a}{2\sqrt{ax-1}} \to x^2+(8-9a)x+25 = 0 \to \Delta = 0$

$(8-9a)^2 = 100 \to a = 2 \to f(5) = 3$

(۳)

$\text{شیب} = \frac{3}{4}, \quad f'(x) = \frac{(2x+m)(x+3)-(x^2+mx+1)}{(x+3)^2} = \frac{x^2+6x+3m-1}{(x+3)^2}$

$x=1 \to \frac{6+3m}{16} = \frac{3}{4} \to m=2, \ n=1 \to m+n=3$

(۴)

$g'(x) = \frac{-3\cos x}{(3+\sin x)^2}, \quad f'(x) = \cos - \frac{9\cos}{(\sin+3)^2} \Rightarrow 3g'\left(\frac{5\pi}{3}\right) - f'\left(\frac{5\pi}{3}\right) = \frac{-27+20\sqrt{3}}{121}$

(۵)

$(fog)'(x) = ? \to fog = -\frac{1}{\sqrt[5]{\frac{1}{x^5+|x^5|}+\left|\frac{1}{x^5+|x^5|}\right|}} = -x$

$\to (fog)'(x) = -1$

(۶)

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

$$\lim_{x\to 0} g(x) = \lim_{x\to 0} \frac{\left(\frac{\sin x-1}{\sin x+1}\right)^2-1}{x} \xrightarrow{Hop} \frac{2\left(\frac{\sin x-1}{\sin x+1}\right)\left(\frac{2\cos}{(\sin x+1)^2}\right)}{1} = -4$$

$d: y = ax + b \xrightarrow{\text{از مبدأ گذر}} b = 0 \to f(x) = ax \xrightarrow{\text{مماس}} f'(x) = a$ ۸

$2\sqrt{x}\,(4x^2+3) = ax \to \left(\frac{1}{\sqrt{x}}\right)(4x^2+3) + (2\sqrt{x})(8x) = a = \frac{20x^2+3}{\sqrt{x}}$

$(2\sqrt{x})(4x^2+3) = x\left(\frac{20x^2+3}{\sqrt{x}}\right) \to 8x^2+6 = 20x^2+3 \to 12x^2-3=0 \to x=\frac{1}{2}\ \checkmark ,\quad x=-\frac{1}{2}\ \times$

$a = 8\sqrt{2}$

$d: y = ax + b \xrightarrow{\text{از مبدأ گذر}} b = 0 \to f(x) = ax \to f'(x) = a$ ۹

$\frac{\sqrt{x}}{-2x^2+x+1} = ax \ ,\quad a = \frac{6x^2-x+1}{(2\sqrt{x})(-2x^2+x+1)^2} \to \frac{\sqrt{x}}{-2x^2+x+1} = \left(\frac{x}{2\sqrt{x}}\right)\left(\frac{6x^2-x+1}{(-2x^2+x+1)^2}\right)$

$\to 6x^2-x+1 = -4x^2+2x+2 \to x=\frac{1}{2}\ \checkmark ,\quad x=-\frac{1}{5}\ \times \Rightarrow f(a) = f\left(\frac{1}{2}\right) = \frac{\sqrt{2}}{2}$

$Loy = \left(\left(\frac{1}{\sqrt{x^2-1}}\right)\left[\frac{1}{\sqrt{x^2-1}}\right]\right)^3 \to \lim_{x\to\frac{\sqrt{5}}{2}} Loy'(x) = g'(x)\times f'(g(x)) =$ ۱۰

$\frac{\sqrt{(x^2-1)^3}}{x} \times 6 \times \frac{\sqrt{(x^2-1)^3}}{x} \times \left(\frac{2}{\sqrt{x^2-1}}\right)^2 = \frac{24(x^2-1)^2}{x^2} = 24 \times \frac{4}{5} \times \frac{1}{16} = \frac{6}{5}$

$\frac{\frac{6}{5}}{-48\sqrt{5}} = \frac{1}{-40\sqrt{5}} = \frac{\sqrt{5}}{200}$

$a(x-1) = -x^2-1 \ ,\quad -\frac{1}{a}x-1 = -x^2-1 \qquad x-1 = -x^2-1 \to x = -x^2 \to x=-1$ ۷

$a=1 \quad x-1 \ ,\ -x-1 \qquad -x-1 = -x^2-1 \to x = x^2 \to x=1$

$-x^2-1 \to x=1 \to y=-2$ ۲ = تعداد