۱۸٫۵

نام و نام خانوادگی ......فاطمه زارع...... پاسخنامه تشریحی تکلیف شماره ...۲۴... کلاس ...دوازدهم ریاضی A - ...

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$f(3)=5$

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

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شیب $m = \frac{2-1}{2+1} = \frac{1}{3} \rightarrow y = \frac{1}{3}x + b \xrightarrow{(2,2)} b = \frac{4}{3} \rightarrow y = \frac{x+4}{3}$

$\frac{x+4}{3} = \sqrt{ax-1} \rightarrow \frac{x^2+8x+16}{9} = ax-1 \rightarrow x^2+8x+16 = 9ax-9 \rightarrow x^2+(8-9a)x+25=0 \xrightarrow{\Delta=0}$

$(8-9a)^2-100=0 \rightarrow 8-9a=\pm 10 \rightarrow a=2$ یا $a=\frac{-2}{9} \rightarrow$ غ ق ق (زیرا ...)

$a=2 \rightarrow f(x) = \sqrt{2x-1} \rightarrow f(5) = \sqrt{9} = 3$ ✓

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$x=1 \rightarrow$ شیب $= \frac{3}{4}$

$\frac{(2x+m)(x+3)-(x^2+mx+1)}{(x+3)^2} = \frac{x^2+6x+3m-1}{(x+3)^2} \xrightarrow{x=1} \frac{6+3m}{16} = \frac{3}{4} \rightarrow m=2$

$y = \frac{1+2+1}{4} = 1 \rightsquigarrow 4-3=n \rightarrow n=1$ $\quad m+n=3$ ✓

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$3g'(\frac{5\pi}{6}) - f'(\frac{5\pi}{6}) = (3g-f)'(\frac{5\pi}{6}) \rightarrow$

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

$-\sin(\frac{5\pi}{6}) = \frac{\sqrt{3}}{2} \rightarrow (3g-f)'(x) = -\cos x \rightarrow (3g-f)'(\frac{5\pi}{3}) = -\cos(\frac{5\pi}{3}) = \frac{-1}{2}$

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$(fog)'(\sqrt[5]{x}) = \frac{-1}{5\sqrt{\frac{1}{x^5+1x^5}+\frac{1}{x^5+1x^5}}} = \frac{-1}{5\sqrt{\frac{1}{x^5}}} = \frac{-1}{\frac{1}{x}} = -x$

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$fog = -x \rightarrow (fog)' = -1$ ✓

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$g(x)=\frac{f(x)-1}{x} \to \frac{\left(\frac{\sin x-1}{\sin x+1}\right)^2-1}{x} \xrightarrow[\sin x\sim x]{\text{هم‌ارزی}} \frac{\frac{x^2-2x+1-x^2-2x-1}{x^2+2x+1}}{x}$

$\frac{\frac{-4x}{x^2+2x+1}}{x}=\frac{-4}{x^2+2x+1}\xrightarrow{x=0} -4$ ✓

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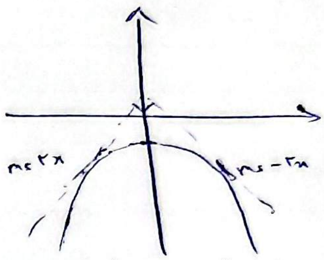
$2x+|-2x|=-1 \to x^2=\frac{1}{4}$

$y=-x^2-1 \to y=\frac{-5}{4}\to$ فاصله خط از محور xها ۱٫۲۵ می‌باشد. ✓



شیب‌ها نسبت به هم قرینه یکدیگرند

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$f(x)=2x^{\frac12}(4x^2+3)=8x^{\frac52}+6x^{\frac12} \to f'(x)=20x^{\frac32}+3x^{-\frac12}$

$\frac{f(a)-0}{a-0}=f'(a) \to f(a)=af'(a) \to$

$8a^{\frac52}+6a^{\frac12}=a(20a^{\frac32}+3a^{-\frac12}) \to 8a^{\frac52}+6a^{\frac12}=20a^{\frac52}+3a^{\frac12}\to$

$12a^{\frac52}=3a^{\frac12} \to 4a^2=1 \to a^2=\frac14 \to a=\pm\frac12 \xrightarrow{x\geq 0} a=\frac12$ ✓

شیب خط $=\frac12$

(جواب پایین صفحه)

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$A(a,f(a)) \to m=\frac{f(a)}{a}=f'(a) \to f(a)=af'(a) \to$

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

$\frac{4a^2-a+1}{2\sqrt a(-2a^2+a+1)^2}=\frac{\sqrt a}{-2a^2+a+1} \to a(4a^2-a+1)=2a(-2a^2+a+1) \to 10a^2-3a-1=0 \to a=\frac12, \frac{-1}{5}$

($a\geq 0$ غ‌ق‌ق $-\frac15$) $\to a=\frac12 \to f(\frac12)=\frac{\sqrt2}{2}$ ✓

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$g(x)=\frac{1}{\sqrt{x^2-1}} \to g(\frac{\sqrt5}{2})=\frac{1}{\sqrt{(\frac{\sqrt5}{2})^2-1}}=2^+ \to [x]=2$

$fog(x)=\left(\frac{1}{\sqrt{x^2-1}}\left[\frac{1}{\sqrt{x^2-1}}\right]\right)^3=8\left(\frac{1}{\sqrt{x^2-1}}\right)^3 \xrightarrow{\text{مشتق‌گیری}}$

$fog'(\frac{\sqrt5}{2})=24\left(\frac{1}{\sqrt{x^2-1}}\right)^2\times\frac{-1}{(x^2-1)}\times 2x=\frac{-48x}{(x^2-1)^2}=\frac{-24\sqrt5}{\frac{1}{16}}=-8\times 48\sqrt5$

برابر $-384\sqrt5$ می‌باشد. ✓

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سوال ۱۸

$$f(x) = 4\sqrt{x}(4x^2+3) = 16x^2\sqrt{x} + 12\sqrt{x} \longrightarrow f'(x) = 40x\sqrt{x} + \frac{3}{\sqrt{x}} = \frac{40x^2+3}{\sqrt{x}}$$

$$y - 4\sqrt{a}(4a^2+3) = \frac{40a^2+3}{\sqrt{a}}(x-a) \xrightarrow{(0,0)} -4\sqrt{a}(4a^2+3) = \frac{40a^2+3}{\sqrt{a}}(-a)$$

$$\longrightarrow 4(4a^2+3) = 40a^2+3 \longrightarrow 16a^2 = 9 \longrightarrow a^2 = \frac{1}{4}$$

$$m = \frac{40(\frac{1}{4})+3}{\sqrt{\frac{1}{4}}} = 13\sqrt{4}$$