شماره تکلیف ۴ | کلاس: ۱۲B | نام و نام خانوادگی: آدرینا حمیدی

۱۹٫۵ آفرین

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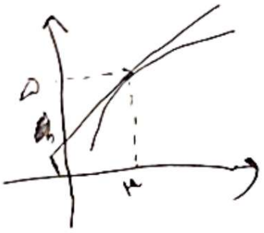

$f'(3)=m=\frac{4}{3}$ ۴

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

$\frac{a+4}{3}=\sqrt{9a-1}$

$\frac{(a+4)^2}{9}=9a-1$

$a^2+8a+16=81a-9$

$a^2+(8a-81a)+25=0$

$a=-\frac{2}{9}$, $a=2$

$\sqrt{9(2)-1}=3$ ۴

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$y=\frac{x^2+mx+1}{x+3} \qquad 4y-3x=n$

$(1, \frac{m+2}{4})$

$y'=\frac{(2x+m)(x+3)-(1)(x^2+mx+1)}{(x+3)^2}=\frac{3}{4} \Rightarrow 2+m=4$

$4(1)-3(1)=n \Rightarrow n=1 \qquad \frac{2+m}{4}=1 \quad m=2$

$m+n=3$ ۴

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

$g(x)=\frac{3}{3+\sin x}$

$3g'(\frac{5\pi}{3})-f'(\frac{5\pi}{3})=(3g(\frac{5\pi}{3})-f(\frac{5\pi}{3}))'=(\frac{9}{3+\sin x}-\frac{9+3\sin x+\sin^2 x}{3+\sin x})'$ ۲

$=(\frac{-\sin x(3+\sin x)}{3+\sin x})'=-\cos x=-\cos\frac{5\pi}{3}=-\frac{1}{2}$

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$f(x)=-\frac{1}{\sqrt[5]{x+|x|}} \qquad g(x)=\frac{1}{x^5+|x^5|} \qquad g'(\sqrt[5]{2})f'(g(\sqrt[5]{2}))=(f\circ g)'(\sqrt[5]{2})$

$x>0: \ -\frac{1}{\sqrt[5]{2x}} \qquad x>0: \ \frac{1}{2x^5}$

$f\circ g=-\frac{1}{\sqrt[5]{2(\frac{1}{2x^5})}}=-x$

$(f\circ g)'(\sqrt[5]{2})=-1$ ۴

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

$f'(0)=\lim_{x\to 0}\frac{f(x)-f(0)}{x-0}=\lim_{x\to 0}\frac{xg(x)+1-1}{x}=\lim_{x\to 0} g(x)$

$f'(x)=2\left(\frac{2\cos x}{(\sin x+1)^2}\right)\left(\frac{\sin x-1}{\sin x+1}\right) \Rightarrow f'(0)=2(2)(-1)=\boxed{-4}$ ۲ ۶

$y=x^2+1 \Rightarrow y=-x^2-1$

$f'(\alpha)f'(-\alpha)=-1 \Rightarrow (-2\alpha)(2\alpha)=-1 \Rightarrow \alpha^2=\frac{1}{4}$ ۷

$\alpha>0 \quad \alpha=\frac{1}{2} \quad f\left(\frac{1}{2}\right)=-\frac{1}{4}-1=-\frac{5}{4}$

$y=-\frac{5}{4}$ ۲

$\boxed{h=\frac{5}{4}}$

$f(x)=2\sqrt{x}(4x^2+3) \qquad f'(\alpha)=f'\left(\frac{1}{2}\right)=\boxed{8\sqrt{2}}$ ۲

$8x^{\frac{5}{2}}+6x^{\frac{1}{2}}$

$f'(x)=8\times\frac{5}{2}x^{\frac{3}{2}}+6\left(\frac{1}{2}\right)x^{-\frac{1}{2}} \Rightarrow f'(\alpha)=x^{-\frac{1}{2}}(20x^2+3) \qquad 20\alpha^2+3=8\alpha^2+6$ ۸

$12\alpha^2=3$

$\frac{f(\alpha)-0}{\alpha-0}=f'(\alpha) \qquad \frac{8\alpha^{\frac{5}{2}}+6\alpha^{\frac{1}{2}}}{\alpha}=8\alpha^{\frac{3}{2}}+6\alpha^{-\frac{1}{2}}=\alpha^{-\frac{1}{2}}(8\alpha^2+6) \qquad \alpha^2=\frac{1}{4}$

$\alpha=\frac{1}{2}$

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

$\frac{\sqrt{x}}{-2x^2+x+1}=\beta x$ ۹

$-2\beta x^3+\beta x^2+\beta x-\sqrt{x}=0$ ۱/۵

$-6\beta x^2+2\beta x+\beta-\frac{1}{2\sqrt{x}}=0$

$f(x)=(x[x])^3 \qquad g(x)=\frac{1}{\sqrt{x^2-1}} \qquad (f\circ g)'\left(\frac{\sqrt{5}}{2}\right)=g'f'\circ g\left(\frac{\sqrt{5}}{2}\right)$

$g'(x)=\frac{-1}{x^2-1}\,\frac{2x}{\sqrt{x^2-1}}=-4(\sqrt{5})(2)=-8\sqrt{5}$

$\frac{(-8)48\sqrt{5}}{-48\sqrt{5}}=\boxed{8}$ ۲ $\qquad (f\circ g)'\left(\frac{\sqrt{5}}{2}\right)=48(-8)\sqrt{5}$ ۱۰

$g\left(\frac{\sqrt{5}}{2}^-\right)=\frac{1}{\sqrt{\frac{1}{4}}}=2^+$

$3(x[x])^2([x])=3((2)(2))^2(2)=48$

$$y = mx \longrightarrow \frac{\sqrt{a}}{-۲a^۲+a+۱} = ma \longrightarrow \frac{۱}{-۲a^۲+a+۱} = m\sqrt{a}$$ ۹

$$m\sqrt{a}(-۲a^۲+a+۱) = ۱ \longrightarrow -۲m(a^{\frac{۵}{۲}}) + m(a^{\frac{۳}{۲}}) + m(a)^{\frac{۱}{۲}} = ۱$$ مشتق

$$-۵m(a^{\frac{۳}{۲}}) + \frac{۳}{۲}m(a^{\frac{۱}{۲}}) + \frac{m}{۲}(a^{-\frac{۱}{۲}}) = ۰$$

$$\frac{m}{۲}(a^{-\frac{۱}{۲}})(-۱۰a^۲+۳a+۱) = ۰ \longrightarrow a = -\frac{۱}{۵} \text{ یا } a = \frac{۱}{۲} \ (a>۰)$$

$$f(a) = \frac{\frac{\sqrt{۲}}{۲}}{-۲(\frac{۱}{۴})+\frac{۱}{۲}+۱} = \frac{\frac{\sqrt{۲}}{۲}}{۱} = \boxed{\frac{\sqrt{۲}}{۲}}$$