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

۱۵/۵

$(f(u))' = u' f'(u)$ ۰	۱
$\dfrac{8+\cos^3 x}{4-\cos^2 x} - \dfrac{4(2+\cos x)}{2\cos x(2+\cos x)}$ ۱/۵ $(f-2g)' = \left(\dfrac{\cos^3 - 4\cos x}{4-\cos^2 x}\right)' = \dfrac{\cos(\cos^2 - 4)}{4-\cos^2 x} \cdot -(\cos x)'$	۲
$(-4x+3)\sqrt{ax} \mid (4x-3)\sqrt{ax} \rightarrow -4\sqrt{ax} + \dfrac{a(-4x+3)}{2\sqrt{ax}}$ $= 8\sqrt{\dfrac{3a}{4}} = 2\sqrt{9} \rightarrow a = 1/2$ ۲	۳
$y = -ax + 2$ شیب $(y) = -a$ مقدار $(y) = -4a + 2$ $\rightarrow -a - 4a + 2 = -1 \rightarrow -5a = -3$ $\rightarrow a = \dfrac{3}{5}$ $f'(4) = -a = \dfrac{-3}{5}$ ۲	۴
$y = 1/7x + \dfrac{5}{7} \rightarrow y' = \dfrac{1}{7}$ $\dfrac{a+3}{(3x+1)^2} = \dfrac{1}{7} \rightarrow 7a + 21 = (3x+1)^2$ ۱/۲۵ $\dfrac{ax-1}{3x+1} = 1/7x + 5 \quad \dfrac{3}{7}x^2 + 1/7x + 15x + 5 = ax - 1$	۵

$f(2)=0 \quad 8-24-b=0 \rightarrow b=-16$ $f'(2)=0 \rightarrow 3x^2+a=0 \rightarrow 12+a=-12$ $-16+12=-4$ ۲ $a=-12$	۶
$f'(x)=2x\cos x^2 \sin^{n-1}(x^2)$ $\lim_{x\to 0} \frac{\sin^n(x^2)\times 2x\cos^3 x^2 \sin^{n-1}(x^2)}{(1-\cos x)^m} \Rightarrow \frac{0}{0}$ ۱/۲۵	۷
$f(x)=\frac{t+1}{t-1} \rightarrow yt-y=t+1 \rightarrow t(y-1)=y+1$ $\rightarrow \sqrt{x}=\frac{y+1}{y-1} \rightarrow y=\left(\frac{x+1}{x-1}\right)^2=\frac{(x+1)^2}{(x-1)^2}$ $y'=\frac{2(x+1)(x-1)^2-2(x-1)(x+1)^2}{(x-1)^4} \xrightarrow[x=2]{} \frac{2\times3\times1-2\times1\times9}{1}=9-18=-12$ ۲	۸
آهنگ متوسط: $\frac{f(b)-f(a)}{b-a}=8(-a+1)-1=11 \Rightarrow a=-1/2$ $\rightarrow x=1$ $f'(x)=3(2x)(x^2+1)^2\times(-1/2x+1)+-1/2(x^2+1)^3$ $\rightarrow f'(1)=6-4=2$ ۱/۵	۹
$\frac{f(b)-f(a)}{b-a}$ آهنگ متوسط $\longrightarrow \frac{\sin\frac{\pi}{2}\cos\pi-\sin\frac{\pi}{4}\cos\frac{\pi}{2}}{\frac{\pi}{2}-\frac{\pi}{4}}=\frac{-1}{\frac{\pi}{4}}$ $\sin^4 x-\cos^4 x=1\times\sin^2 x-\cos^2 x \rightarrow \frac{-4}{\pi}$ $=-\cos 2x$ $\frac{-\cos 2\times\frac{\pi}{2}-\cos\frac{\pi}{2}}{\frac{\pi}{2}-\frac{\pi}{4}}=\frac{1}{\frac{\pi}{4}}=\frac{4}{\pi} \Longrightarrow$ شیب -1 ۲	۱۰

$$g'(x) = f'(\tan^2 x + \sqrt{2}\cos x) \times (2\tan x(1+\tan^2 x) - \sqrt{2}\sin x)$$ ۱

$$g'(\frac{\pi}{2}) = f'(1 + \sqrt{2} \times \frac{\sqrt{2}}{2}) \times 2 \times 1 \times (1+1^2) - (\sqrt{2} \times \frac{\sqrt{2}}{2})$$

$$\underset{\sqrt{3}}{\cancel{g'(\frac{\pi}{2})}} = f'(2) \times [\underset{3}{\cancel{2(2)}} - 1] \longrightarrow f'(2) = \frac{\sqrt{3}}{3}$$

$$f - 2g(\frac{7\pi}{4}) = \frac{(2+\cancel{\cos x})(\cos^2 x - 2\cos x + 4)}{(2-\cos x)(2+\cancel{\cos x})} - \frac{4}{2-\cos x} = \frac{\overset{\cos x(\cancel{\cos x} - 2)}{\cos^2 x \cancel{-2\cos x}}}{2-\cancel{\cos x}} = -\cos x$$ ۲

$$(f - 2g)' = -(\cos x)' = +\sin x \longrightarrow \sin(\frac{7\pi}{4}) = \boxed{-\frac{1}{2}}$$

$$\frac{ax-1}{3x+1} = \frac{x}{7} + \frac{5}{7} \longrightarrow 7ax - 7 = 3x^2 + x + 15x + 5$$ ۵

$$\boxed{a = \frac{4}{7}} \qquad \boxed{a = 4}$$

$$3x^2 + x(16 - 7a) + 12 = 0 \xrightarrow{\Delta = 0} (16-7a)^2 - 12^2 = (16 - 7a - 12)(16 - 7a + 12)$$

$\boxed{a=4} \longrightarrow 3x^2 - 12x + 12 \longrightarrow \boxed{x=2}$ ✓

$a = \frac{4}{7} \longrightarrow 3x^2 + 12x + 12 \longrightarrow x = -2$ × ناصیداول

$$\lim_{x\to 0} \frac{\sin^n(x^2) \times 2x\sin^{n-1}(x^2) \times \cos x^2}{(2\sin^2\frac{x}{2})^m} \xrightarrow{\text{هم‌ارزی}} \lim_{x\to 0} \frac{(x^2)^n \times n \times (x^2)^{n-1} \times 2x}{(2(\frac{x}{2})^2)^m} = \frac{(x)^{2n+2n-2+1} \times 2n}{(x)^{2m} \times \frac{1}{2}}$$ ۷

$$= \frac{2nx^{4n-1}}{\frac{1}{2^m} \times x^{2m}} = 2^{m+1} \times n \times x^{4n-2m-1}$$

$\rightarrow 4n - 2m - 1 = 0 \rightarrow n = \frac{2m+1}{4}$

$\rightarrow 2^{m+1} \times \frac{2m+1}{4} = 32\sqrt{2} \longrightarrow m = \frac{7}{2}, \; n = 2 \rightarrow \boxed{2m + n = 9}$

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$$\frac{f(0)-f(-1)}{0-(-1)} = \frac{1-8(-a+1)}{1} = 8a-7=-11 \rightarrow 8a=-4 \rightarrow \boxed{a=-\frac{1}{2}}$$

$$f'(x) = 3(x^2+1)^2(2x)(ax+1) + a(x^2+1)^3 \xrightarrow{-2a=1} f'(1) = 3(2)^2(2)\left(\frac{1}{2}\right) + -\frac{1}{2}(2)^3$$

$$f'(1) = 12-4 = 8$$

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$$x=\frac{\pi}{2} \rightarrow \sin\frac{\pi}{4}\cos\frac{\pi}{2}=0$$

$$x=\frac{\pi}{2} \rightarrow \sin\frac{\pi}{2}\cos\pi=-1$$

$$\rightarrow \frac{-1-0}{\frac{\pi}{2}} = \overset{1}{\boxed{-\frac{4}{\pi} = \frac{\Delta y}{\Delta x}}}$$

$$\sin^4 x-\cos^4 x = (\sin^2 x \overset{1}{\cancel{+}} \cos^2 x)(\overset{-\cos 2x}{\cancel{\sin^2 x - \cos^2 x}}) = -\cos 2x$$

$$x=\frac{\pi}{2} \rightarrow -\cos\frac{\pi}{2}=0$$

$$x=\frac{\pi}{2} \rightarrow -\cos\pi=1$$

$$\rightarrow \frac{1-0}{\frac{\pi}{2}} = \overset{2}{\boxed{\frac{4}{\pi} = \frac{\Delta y}{\Delta x}}} \rightarrow \frac{-\frac{4}{\pi}}{\frac{4}{\pi}} = -1$$