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نام و نام خانوادگی: محمد پارسا آخوندی — پاسخنامه تشریحی تکلیف شماره ۲۳ — کلاس ....

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$$g'\left(\frac{\pi}{4}\right) = \left(2\times\left(1+\tan^2\left(\frac{\pi}{4}\right)\right) - \sqrt{2}\sin\left(\frac{\pi}{4}\right)\right)\times f'(2) = \sqrt{3}$$

$$3 \longrightarrow 3\times f'(2) = \sqrt{3}$$

$$f'(2) = \frac{\sqrt{3}}{3}$$

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$$f'(x) = \frac{-36\cos^2 x\sin x}{(4-\cos^3 x)^2}$$

$$g'(x) = \frac{-2\sin x}{(2-\cos x)^2}$$

$$f'\left(\frac{7\pi}{6}\right) - 2g'\left(\frac{7\pi}{6}\right) = (f-2g)'\left(\frac{7\pi}{6}\right)$$

$$x = \left(\frac{7\pi}{6}\right) \to f'\left(\frac{7\pi}{6}\right) - 2g'\left(\frac{7\pi}{6}\right) = \frac{864}{1551+192\sqrt{3}} + \frac{8}{19+8\sqrt{3}}$$

$$\to (f-2g)' = \left(\frac{8+\cos^3 x}{4-\cos^3 x} - \frac{4}{2-\cos x}\right) = \left(\frac{(\cos x+2)(\cos^2 x - 2\cos x + 4)}{(2-\cos x)(2+\cos x)} - \frac{4}{2-\cos x}\right)' =$$

$$\left(\frac{\cos(\cos x - 2)}{-(\cos x - 2)}\right)' = -(\cos x)' = \sin x \xrightarrow{x = 7\pi/6} \sin\left(\frac{7\pi}{6}\right) = \frac{-1}{2}$$

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$$f'_+(x) \longrightarrow 4\sqrt{ax} + \frac{a}{2\sqrt{ax}}\cdot(4x-3) = \frac{3a}{\sqrt{\frac{3a}{4}}}$$

$$f'_-(x) \longrightarrow -4ax + \frac{a}{2\sqrt{ax}}(3-4x) = \frac{-3a}{\sqrt{\frac{3a}{4}}}$$

$$\xrightarrow{-} \frac{6a}{\sqrt{\frac{3a}{4}}}$$

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$$\frac{\cancel{6}\,3a}{\sqrt{\frac{3a}{4}}} = 2\sqrt{6} \to 3a = \sqrt{\frac{9a}{2}} \to 18a^2 = 9a \to 2a = 1 \to a = \frac{1}{2}$$

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$$(2-4a) + (-a) = -1 \longrightarrow 3 = 5a \to a = \frac{3}{5}$$

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

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$$y_1 = \frac{x+d}{7} \to m = \frac{1}{7}$$

$$y_2 = \frac{(a(3x+1)) - (3(ax-1))}{(3x+1)^2}$$

$$\frac{1}{7} = \frac{a+3}{9x^2+6x+1}$$

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$$7a+21 = (3x+1)^2,\quad \frac{ax-1}{3x+1} = \frac{x+d}{7}$$

$$7a^2 - 24a + 16 = 0 \to a = 4,\ \frac{4}{7}\times$$

$f(2) = 8 + 2a - b = 0$ $f'(2) = 12 + a = 0$ $\Big\}\ \underbrace{a = -12\ ,\ b = -16}$ $b - a = -16 - (-12) = -4$ ۲	۶
$\sin x^2 \sim x^2 \longrightarrow f'(x) = 2n\,x^{2n} \longrightarrow f(x)\,f'(x) = 2n\,x^{4n-1}$ $1 - \cos x \sim \frac{x^2}{2} \longrightarrow (1-\cos x)^m = \frac{x^{2m}}{2^m} \longrightarrow 2m + n = 9$ $\lim \longrightarrow 2n \times 2^m \times x^{4n-1-2m} \longrightarrow 4n - 1 - 2m = 0 \longrightarrow 2m = 4n - 1$ $2n \times 2^m = 32\sqrt{2} \longrightarrow m = \frac{4n-1}{2} \longrightarrow 2n \times 2^{\frac{(4n-1)}{2}} = 2^5 \times 2^{\frac{1}{2}} \longrightarrow m = \frac{7}{2}\ ,\ n = 2$ ۲	۷
$f^{-1}(x) \Longrightarrow x = \frac{\sqrt{y}+1}{\sqrt{y}-1} \longrightarrow \sqrt{y}\,x - x = \sqrt{y} + 1 \longrightarrow \sqrt{y}\,(x-1) = x+1$ $\sqrt{y} = \frac{x+1}{x-1} \longrightarrow y = \left(\frac{x+1}{x-1}\right)^2 \xrightarrow{\text{مشتق}} 2 \times \left(\frac{(x-1)-(x+1)}{(x-1)^2}\right) \times \left(\frac{x+1}{x-1}\right)$ $x = 2 \longrightarrow 2 \times \left(\frac{-2}{1}\right) \times \left(\frac{3}{1}\right) = -12$ ۲	۸
$\frac{f(0) - f(-1)}{1} = \frac{1 - (8 - 8a)}{1} = -11 \longrightarrow 8a - 7 = -11 \longrightarrow a = -\frac{1}{2}$ $x = 1 \longrightarrow 3 \times 2 \times (2)^2 \times \left(-\frac{1}{2} + 1\right) + (\cancel{a})\,(\cancel{x^2+1})^{2}$ $^{-\frac{1}{2}}\quad 8$ $24 \times \frac{1}{2} = 12 + 4 = 8$ ۲	۹
$\frac{f(\frac{\pi}{2}) - f(\frac{\pi}{4})}{\frac{\pi}{4}} = \frac{-1 - 0}{\ } = \frac{\frac{-1}{1}}{\frac{\pi}{4}} = \frac{-4}{\pi}$ $\frac{f(\frac{\pi}{2}) - f(\frac{\pi}{4})}{\frac{\pi}{4}} = \frac{1 - 0}{\frac{\pi}{4}} = \frac{4}{\pi}$ $\Big\}\ \frac{\frac{-4}{\pi}}{\frac{4}{\pi}} = -1$ ۲	۱۰