

نام و نام خانوادگی: کوروش شیرانی فرآیند پاسخنامه تشریحی تکلیف شماره ۲۳ کلاس دوازدهم A

$$g(x) = f(\tan^2 x + \sqrt{2} \cos x) \rightarrow u(x) = \tan^2 x + \sqrt{2} \cos x$$

$$g(x) = f(u(x)), \quad g'(x) = u'(x) \cdot f'(u(x)), \quad u'(x) = 2 \tan x \cdot \sec^2 x - \sqrt{2} \sin x$$

$$u'\left(\frac{\pi}{4}\right) = 2(1)(\sqrt{2})^2 - \sqrt{2}\left(\frac{\sqrt{2}}{2}\right) = 2(2) - 1 = 3 \quad u\left(\frac{\pi}{4}\right) = 1^2 + \sqrt{2}\left(\frac{\sqrt{2}}{2}\right) = 2$$

$$g'\left(\frac{\pi}{4}\right) = 3 \cdot f'(2) \Rightarrow \sqrt{3} = 3 \cdot f'(2) \Rightarrow f'(2) = \frac{\sqrt{3}}{3} \quad \checkmark$$

$$1 + \cos^2 x = (1 + \cos x)(1 - \cos x + \cos^2 x) / (1 - \cos^2 x) = (1 + \cos x)(1 + \cos x) / (1 - \cos x)$$

$$\Rightarrow f(x) = \frac{\cos^2 x - \cos x + 1}{1 - \cos x} = \frac{(1 - \cos x)^2 + \cos x}{1 - \cos x} = (1 - \cos x) + \frac{\cos x}{1 - \cos x}$$

$$\Rightarrow f(x) = \frac{\cos^2 x - \cos x + 1}{1 - \cos x} = \frac{\cos x(\cos x - 1) + 1}{1 - \cos x} = -\cos x + \frac{1}{1 - \cos x}$$

$$g(x) = \frac{1}{1 - \cos x} \rightarrow \frac{1}{1 - \cos x} = f(g(x)) \Rightarrow f(x) = -\cos x + \frac{1}{1 - \cos x} \Rightarrow f'(x) = \sin x + \frac{\sin x}{(1 - \cos x)^2}$$

$$x = \frac{\pi}{4} \rightarrow \sqrt{a} = \frac{\sqrt{2a}}{2}$$

مشتق راست

$$\left. \begin{array}{l} \sqrt{2a} \\ -\sqrt{2a} \end{array} \right\}$$

$$\sqrt{2a} - (-\sqrt{2a}) = 2\sqrt{2a} = 2\sqrt{2} \Rightarrow \sqrt{2a} = \sqrt{2} \Rightarrow a = 1$$

$$\sqrt{2a} = \sqrt{2} \Rightarrow 2a = 2 \Rightarrow a = 1$$

$$f'(x) = -a$$

$$f(x) = -a(x) + 1 = -ax + 1 \quad \left. \begin{array}{l} f'(x) = -a \\ f(x) = -ax + 1 \end{array} \right\} f'(x) + f(x) = -1$$

$$\Rightarrow (-a) + (-ax + 1) = -1 \Rightarrow -ax + 1 = -1 \Rightarrow -ax = -2 \Rightarrow a = \frac{2}{x}$$

$$f'(x) = -0/2 = -\frac{1}{2} \quad \checkmark$$

$$y = \frac{1}{x} + \frac{a}{x}$$

$$\Rightarrow \frac{1}{x} + \frac{a}{x} = \frac{(x+a)}{x}$$

$$y' = \frac{a+x}{(x+a)^2} \Rightarrow \frac{a+x}{(x+a)^2} = \frac{1}{x}$$

$$\frac{ax-1}{x^2+a^2} = \frac{x+a}{x^2} \Rightarrow xam - v = (x+a)(x+a)$$

$$\Rightarrow xam - v = x^2 + 2ax + a^2 \Rightarrow xam = x^2 + 2ax + a^2 + v \Rightarrow xam = x^2 + 2ax + a^2 + v$$

$$x = 2 \quad v(a+x) = (4+1)^2 = 25 \Rightarrow a+x = 5 \Rightarrow a = 3$$

$$\left. \begin{array}{l} \text{خط: } y = \frac{1}{x} + \frac{a}{x} = 1 \\ \text{نقطه: } y = \frac{1-1}{4+1} = \frac{0}{5} = 0 \end{array} \right\} x = \sqrt{2a} = \sqrt{6}$$

$$f'(x) = 3x^2 + a \xrightarrow{x=2} 3(2)^2 + a = 0 \Rightarrow 12 + a = 0 \Rightarrow a = -12$$

$$f(2) = (2)^3 + (-12)(2) + b = 0 \Rightarrow 8 - 24 + b = 0 \Rightarrow -16 + b = 0 \Rightarrow b = 16$$

$$-16 - (-12) = -16 + 12 = -4 = b - a$$

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$$\lim_{n \rightarrow \infty} \frac{\sin^n(n) \times n \sin^{n-1}(n) \times \cos(n) \times (n)}{(n \sin^n(n))^n} \xrightarrow{\text{Simp}} \lim_{n \rightarrow \infty} \frac{(n)^n \times (n)^{n-1} \times n}{(n \sin^n(n))^n} =$$

$$\lim_{n \rightarrow \infty} \frac{n^{n+n} \times n}{(n \sin^n(n))^n} = \lim_{n \rightarrow \infty} \frac{n^{2n+1}}{n^n \sin^{2n}(n)} = \lim_{n \rightarrow \infty} n^{n+1} \times \frac{1}{\sin^{2n}(n)}$$

$$\left\{ \begin{array}{l} n - n - 1 = 0 \rightarrow n = \frac{n+1}{2} \\ n = \sqrt{n} \end{array} \right. \rightarrow n^{n+1} \times \frac{n+1}{2} = n^{\sqrt{n}} \rightarrow (n+1)^{n+1} = n^{\sqrt{n}} \rightarrow n = \frac{n}{2} \quad n+n=9$$

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$$(f^{-1})'(b) = \frac{1}{f'(a)} \quad \frac{\sqrt{a}+1}{\sqrt{a}-1} = 2 \Rightarrow \sqrt{a}+1 = 2(\sqrt{a}-1) \Rightarrow \sqrt{a} = 3$$

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

$$f'(9) = \frac{-1}{\sqrt{9}(\sqrt{9}-1)^2} = \frac{-1}{3 \times 4} = -\frac{1}{12} \rightarrow \frac{1}{12} = -12$$

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$$\frac{f(0) - f(-1)}{0 - (-1)} = -1 \Rightarrow f(0) = (0^2 + 1)^2 (a(0) + 1) = 1 \times 1 = 1$$

$$f(-1) = ((-1)^2 + 1)^2 (a(-1) + 1) = 2^2 \times (-a + 1) = 4(1-a)$$

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

$$f'(x) = 2(x^2 + 1)^2 (ax + 1) + (x^2 + 1)^2 (a) \xrightarrow{x=1} f'(1) = 1$$

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$$\frac{f(b) - f(a)}{b - a} \quad f(x) = \sin x \cos x \quad \left. \begin{array}{l} x = \frac{\pi}{4} \rightarrow \sin \frac{\pi}{4} \cos \frac{\pi}{4} = 1 \times 1 = 1 \\ x = \frac{\pi}{2} \rightarrow \sin \frac{\pi}{2} \cos \frac{\pi}{2} = 1 \times 0 = 0 \end{array} \right\} 1 - 0 = 1$$

$$y = \sin^2 x - \cos^2 x \quad \left. \begin{array}{l} x = \frac{\pi}{4} : -\cos^2 \frac{\pi}{4} = -(-1) = 1 \\ x = \frac{\pi}{2} : -\cos^2 \frac{\pi}{2} = 0 \end{array} \right\} 1 - 0 = 1$$

$$\text{چون } b-a \text{ برابر است } \rightarrow \text{نسبت} = \frac{-1}{1} = -1$$

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