

Subject :

Year. Month. Date. ()

دوازدهم دبیر

ریاضیات

نیمه اول

بهار ۱۴۰۰

$$g(x) = f(\tan^2 x + \sqrt{2} \cos x) \text{ و } g'(\frac{\pi}{4}) = \sqrt{2} \quad (1)$$

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

$$g'(\frac{\pi}{4}) = (2 \times 1 \times 1 - 1) f'(1+1) = 2f'(2) = \sqrt{2} \quad f'(2) = \frac{\sqrt{2}}{2}$$

$$f'(\frac{\sqrt{2}}{2}) = 2g'(\frac{\sqrt{2}}{2}) \Rightarrow (f - 2g)'(\frac{\sqrt{2}}{2}) \Rightarrow \sin(\frac{\sqrt{2}}{2}) = -\frac{1}{2} \quad (2)$$

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

$$-\cos x \rightarrow \sin \alpha \quad (-\frac{1}{2})$$

$$f\sqrt{x} + \frac{a}{2\sqrt{x}} \times 0 = f\sqrt{x} \quad \Delta \sqrt{\frac{x}{2}} a = 2\sqrt{x} \quad (3)$$

$$(\frac{x}{2})' \rightarrow -f\sqrt{x} + \frac{a}{2\sqrt{x}} \times 0 = -f\sqrt{x} \quad a = \frac{1}{2}$$

$$-fa + 2 - a = -1 \quad 4 - 2a = -1 \quad a = \frac{5}{2} \quad (4)$$

$$\frac{a(\mu x + 1) - \mu(ax - 1)}{(\mu x + 1)^2} = \frac{1}{x} \quad \frac{\mu + a}{(\mu x + 1)^2} = \frac{1}{x} \quad (5)$$

$$ax^2 + 6x + 1 = \sqrt{a + \mu} \quad \Delta = 0 \rightarrow \mu^2 - 6\mu + 9 = 0 \rightarrow \mu = 3$$

$$-20 - \sqrt{a} = 1 \rightarrow a = -21$$

$$f'(x) = \mu x^2 + a \quad b - a = -16 + 12 = -4 \quad a = -12 \quad b = -16 \quad (6)$$

$$\frac{x^{\mu} \times \mu x^{\mu-1}}{(\frac{x^{\mu}}{\mu})^m} = \mu x^{\mu} \times x^{\mu-1-\mu m} \quad \mu = 2 \quad m = \frac{\mu}{2} \quad \mu + m = 4 \quad (7)$$

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(1)

$$\frac{\sqrt{x} + 1}{\sqrt{x} - 1} = y$$

$$\sqrt{x} + 1 = y\sqrt{x} - y$$

$$\sqrt{x} = y \quad x = 9$$

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

$$\frac{-\frac{1}{2}}{\frac{1}{2}} = \left(-\frac{1}{1}\right)$$

$$\frac{f(0) - f(-1)}{0 - (-1)} = f(0) - f(-1) = 1 - 1(-1+1) = 1 - 1 = 0$$

(9)

$$f'(1) = 4 \cdot 2x \cdot (x^2 + 1) \left(-\frac{1}{2} + 1\right) + \left(-\frac{1}{2}\right) (x^2 + 1)^2 = 12 - 1 = 11$$

$$\frac{f\left(\frac{\pi}{2}\right) - f\left(\frac{\pi}{4}\right)}{g\left(\frac{\pi}{2}\right) - g\left(\frac{\pi}{4}\right)} = \frac{-1 - 0}{1 - 0} = -1$$

(10)