

۱۹/۷۵ آمین !!

$$Dg \circ f = \left\{ \lambda \in Df \mid f(\lambda) \in Dg \right\}$$

$$\lambda - 1 > 0 \rightarrow \lambda > 1 \quad (1)$$

$$\log \lambda^{-1} > 0 \rightarrow \lambda - 1 \geq 1 \rightarrow \lambda \geq 2 \quad (2) \rightarrow 1 \cap 2 \rightarrow \lambda \geq 2$$

$$Dg \rightarrow -(\lambda^2 - 4\lambda + 1) \geq 0 \rightarrow (\lambda - 2)^2 \leq 0 \rightarrow \lambda = 2 - \sqrt{\log \lambda^{-1}} = 2 \quad (3)$$

$$\rightarrow \log \lambda^{-1} = 1 \rightarrow \lambda = 1/e$$

$$f(g(\lambda)) = 2(\lambda^2 - 4\lambda + 1) - 1 = 2\lambda^2 - 8\lambda + 1 \quad -2$$

$$g(f(\lambda)) = (2\lambda - 1)^2 - 2(2\lambda - 1) + 1 = 4\lambda^2 - 8\lambda + 1 - 4\lambda + 2 + 1 = 4\lambda^2 - 12\lambda + 4 \quad (4)$$

$$\rightarrow 4\lambda^2 - 12\lambda + 4 = 2\lambda^2 - 8\lambda + 1$$

$$2\lambda^2 - 4\lambda + 3 = 0 \rightarrow \alpha^2 + \beta^2 = (\alpha + \beta)^2 - 2\alpha\beta = 100 - 2 \times \frac{100}{2} = 0$$

$$g(\lambda) = \omega \lambda^2 + 1 \quad \lambda = t \rightarrow \lambda = \frac{t}{2} \quad g(t) = \omega \times \frac{t^2}{4} + 1 \quad -3$$

$$g(\lambda) = \omega \frac{\lambda^2}{2} + 1 \quad g(\lambda - 1) = \omega \frac{(\lambda - 1)^2}{2} + 1 = \omega \frac{(\lambda^2 - 2\lambda + 1)}{2} + 1$$

$$= \frac{\omega \lambda^2}{2} - \frac{\omega \lambda}{1} + \frac{\omega}{2} + 1 \quad \lambda 5 = \frac{\omega}{2} \times \frac{1}{\omega} = \frac{1}{2} + \frac{1}{2} = 1$$

$$g(1) = 1 \times \frac{1}{2} - \frac{1}{1} + \frac{1}{2} + 1 = 1$$

$$f(g(\lambda)) = 2g(\lambda) - 1 = 2\lambda^2 - 4\lambda - 1 \rightarrow 2g(\lambda) = 2\lambda^2 - 4\lambda + 1 \quad -4$$

$$g(\lambda - 1) = (2\lambda - 1)^2 = 4\lambda^2 - 4\lambda + 1$$

$$f - g \Rightarrow y = -x + 1 \quad fog(\lambda) =$$

$$f(\lambda) - g(\lambda) = -\lambda + 1 \rightarrow 2\lambda + 1 - g(\lambda) = -\lambda + 1$$

$$\begin{cases} 2f(\lambda) - 2g(\lambda) = 1 \\ -2f(\lambda) + 2g(\lambda) = 2\lambda - 1 \end{cases} \rightarrow \begin{cases} f(\lambda) = 2\lambda + 1 \\ g(\lambda) = 2\lambda - 1 \end{cases} \quad (5)$$

$$f(g(\lambda)) = f(2\lambda - 1) = 2(2\lambda - 1) + 1 = 4\lambda - 1 \rightarrow 4\lambda - 1 = 0 \rightarrow \lambda = \frac{1}{4} = a$$

$$f(g(x)) \leq g(f(x)) \rightarrow$$

$$f(g(x)) = f(\log x) = a^{\log x} = x^a$$

$$g(f(x)) = g(a^x) = \log a^x = x \log a$$

$$\rightarrow x^a \leq x \log a \rightarrow 0 < x \leq \frac{1}{\log a}$$

صحيح

$$f\left(x - \frac{1}{x}\right) = \left(x - \frac{1}{x}\right)^a + x - \frac{1}{x} \quad f(x) = x^a + x$$

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$$Df \circ g = \left\{ x \in Dg \mid g(x) \in Df \right\} = (0, 1) \textcircled{1}$$

-1

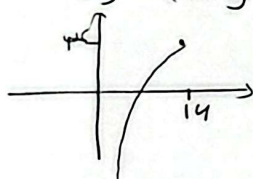
$$1 - x - x^a > 0 \rightarrow x(1 - x) > 0 \rightarrow 0 < x < 1$$

$$f(g(x)) = f(1 - x - x^a) = \log(1 - x - x^a)$$

$$1 - x - x^a \rightarrow 0 < 1 - x - x^a \leq 1$$

$$\rightarrow -\infty < \log(1 - x - x^a) \leq 0 \textcircled{2}$$

$$1 \cap 2 = (0, 1] \rightarrow 1 \supset 2 \supset \emptyset$$



$$f\left(\frac{f(x)}{x}\right) = 1 - x f'(x) = 1 - x t^a \rightarrow f(x) = 1 - x t^a$$

لقد

$$h(x-1) = (x-1)^a + x(x-1) + 1 = x^a - x^{a+1} + x^2 - x + 1 =$$

$$x^a - x^{a+1} + x^2 - x + 1 = 1 - x^{a+1} \rightarrow x^a + x^2 - x - 1 = 0$$

$$x^a = -x^2 + x + 1$$



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$$g(f(x)) = g\left(x + \frac{1}{x}\right) = a x^a + x$$

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$$\rightarrow x + \frac{1}{x} = x^a \rightarrow x^a - x - \frac{1}{x} = 0 \rightarrow (x-1)(x+1) = 0 \rightarrow x = 1$$

$$\rightarrow x = -1$$

$$x = 1 \rightarrow g(x) = 4a + 1 = 1 \rightarrow a = 0$$

$$x = -1 \rightarrow g(x) = -a - 1 = 1, a = -1$$

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