

$$f \circ f\left(\frac{2}{3}\right)$$

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$$f(n) = \begin{cases} c + \frac{\pi n}{\varepsilon} & n \leq 1 \\ \sqrt{n^2 + 1} & n > 1 \end{cases}$$

$$f\left(\frac{2}{3}\right) \Rightarrow c + \frac{\pi}{\varepsilon} \Rightarrow \frac{c \cdot s}{\sin}\left(\frac{\pi}{\varepsilon}\right) \Rightarrow \frac{\sqrt{3}}{\frac{1}{2}} \Rightarrow \sqrt{3}$$

جابجایی در مضامین

$$f(\sqrt{3}) = \sqrt{(\sqrt{3})^2 + 1} \Rightarrow 2$$

$$f\left(\frac{1}{n}\right) = \sqrt{\frac{2n-1}{n^2}}, \quad g(n) = 2 \cos^2 n$$

$$g\left(\frac{\pi}{4}\right) = 2 \cos^2\left(\frac{\pi}{4}\right) \Rightarrow 2 \left(\frac{1}{2}\right)^2 = \frac{1}{2}$$

$$f\left(\frac{1}{2}\right) \Rightarrow \sqrt{\frac{3}{4}} = \frac{\sqrt{3}}{2}$$

سی ۲ = ۲

$$f(n) = [n], \quad g(n) = \frac{n}{1-n}$$

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

$$f(2-\sqrt{2}) \Rightarrow [2-\sqrt{2}] \Rightarrow \frac{1}{2}$$

سوال ۳ - ۲ درستی

$$F(n) = \sin n, \quad g(n) = n \sqrt{1-n^2}$$

$$g \circ f\left(\frac{\pi}{2}\right)$$

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$$F\left(\frac{\pi}{2}\right) =, \quad \sin\left(\frac{\pi}{2}\right) = \frac{\sqrt{2}}{2}$$

$$g\left(\frac{\sqrt{2}}{2}\right) = \frac{\sqrt{2}}{2} \times \sqrt{\frac{1}{2}} =, \quad \frac{\sqrt{2}}{2} \times \frac{1}{\sqrt{2}} = \frac{1}{2}$$

$$F(n) = \{(2,0), (4,0), (8,12), (10,12)\} \quad \text{سوال ۲}$$

$$g(n) = \{(2,6), (4,2), (6,8), (8,10)\}$$

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الف) $g \circ f(n) =$

$$2 \rightarrow 0 \quad X$$

$$4 \rightarrow 0 \quad X$$

$$8 \rightarrow 12 \quad X$$

$$10 \rightarrow 12 \quad X$$

ب) $f \circ g$

$$2 \rightarrow 6 \rightarrow 0$$

$$4 \rightarrow 2 \rightarrow 0$$

$$6 \rightarrow 8 \rightarrow 12$$

$$8 \rightarrow 10 \rightarrow 12$$

ج) $f \circ g$

$$F(n) = \{(2,0), (4,0), (6,12), (8,12)\}$$

سوال ۵
درستی یا خطا

پ) $f \circ f$

$$\varepsilon \rightarrow 5 \rightarrow X$$

$$6 \rightarrow 5 \rightarrow X$$

$$8 \rightarrow 12 \rightarrow X$$

$$10 \rightarrow 12 \rightarrow X$$

د) $g \circ g$

$$\varepsilon \rightarrow 6 \rightarrow 8$$

$$2 \rightarrow \varepsilon \rightarrow 6$$

$$6 \rightarrow 8 \rightarrow 10$$

$$8 \rightarrow 10 \rightarrow X$$

$$g \circ g(x) = \{(\varepsilon, 8), (2, 6), (6, 10)\}$$

سوال ۵
 $H(x) = \{(2, 1), (4, 2), (\varepsilon, 0), (1, v)\}$

$g(x) = \{(1, 2), (3, 1), (a, 4), (b, 1)\}$

$f \circ g =$

$$\begin{array}{l} 1 \rightarrow 2 \rightarrow 1 \\ 4 \rightarrow 1 \rightarrow v \\ a \rightarrow 4 \rightarrow 1 \\ b \rightarrow 1 \rightarrow v \end{array}$$

$a = \varepsilon$ (a, b) $b = 5$

$(a, 4) \rightarrow (\varepsilon, 0)$ $(\varepsilon, 1)$

$g \circ f =$

$$\begin{array}{l} 2 \rightarrow 1 \rightarrow 2 \\ 3 \rightarrow 2 \rightarrow X \\ 1 \rightarrow v \rightarrow X \end{array}$$

سوال کے تین متغیر

$$F(f(m)) = 2m + 3, \quad g(2m+3) = 4m - 2$$

$$g \circ f(-1)$$

$$f(m) = am + b$$

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$$F(f(m)) = a(am+b) + b = a^2m + ab + b$$

$$F(f(m)) = 2m + 3$$

$$a^2 = 2, \quad ab + b = 3$$

$$f(m) = \begin{cases} 2m + 1 & \text{if } b=1 \leftarrow 2, a=2 \\ -2m - 5 & \text{if } b=-5 \leftarrow 2, a=-2 \end{cases}$$

$$g(m) = 2m + h \Rightarrow g(2m+3) = 4m - 2$$

$$2(2m+3) + h = 4m - 2$$

$$4m + 6 + h = 4m - 2$$

$$4m = 6 \Rightarrow m = \frac{3}{2}, \quad \frac{3}{2} + h = -2$$

$$\frac{3}{2} + h = -2 \Rightarrow h = -\frac{7}{2}$$

$$g(m) = \frac{3}{2}m - \frac{7}{2}$$

$$g(f(-1)) = g(-1)$$

$$f(-1) = -1$$

$$\Rightarrow \frac{3}{2}(-1) - \frac{7}{2} = -5$$

$$f(x) = \sqrt{x+|x|}, \quad g(x) = \frac{1}{x^2 - \varepsilon x} \quad \begin{array}{l} \text{شماره حقیقی} \\ \text{در آن} \end{array}$$

$$g \circ f = ?$$

$$f(x) = \sqrt{x+|x|} \quad \begin{array}{l} x \rightarrow - \Rightarrow f(x) = 0 \\ x \rightarrow 0 \Rightarrow f(x) = 0 \\ x \rightarrow + \Rightarrow f(x) = \sqrt{2x} \end{array}$$

$$\frac{1}{x^2 - \varepsilon x} \Rightarrow \neq 0 \quad x(x - \varepsilon) \rightarrow \begin{array}{l} \neq 0 \\ \varepsilon \end{array}$$

$$0 \rightarrow \text{شماره حقیقی}, 0 \text{ (شماره حقیقی)}$$

$$\varepsilon \rightarrow \sqrt{2x} \Rightarrow x = \frac{\varepsilon^2}{2}$$

$$D_{g \circ f} = (0, +\infty) - \left\{ \frac{\varepsilon^2}{2} \right\}$$

$$f(x) = \sqrt{1-x^2}, \quad g(x) = \sqrt{x} \quad \begin{array}{l} \text{شماره حقیقی} \\ \text{در آن} \end{array}$$

$$(f+g) \circ f \Rightarrow f \circ f(x) + g \circ f(x) =$$

$$f \circ f(x) =, x \in D_f \quad D_f \Rightarrow 1-x^2 \geq 0 \Rightarrow -1 \leq x \leq 1$$

$$f(x) \in D_f \quad f(x) \in D_f \quad -1 \leq \sqrt{1-x^2} \leq 1$$

$$\Rightarrow 0 \leq 1-x^2 \leq 1 \quad -1 \leq -x^2 \leq 0 \quad 1 \geq x^2 \geq 0$$

$$g \circ f(x) \quad x \in D_f \Rightarrow -1 \leq x \leq 1 \quad \begin{array}{l} -1 \leq x \leq 1 \\ \Rightarrow x^2 \leq 1 \Rightarrow -1 \leq x \leq 1 \end{array}$$

$$f(x) \in D_g \quad \sqrt{1-x^2} \geq 0 \quad 1-x^2 \geq 0$$

$$D_{g \circ f} \Rightarrow x \geq 0$$

$$D(f+g) \Rightarrow [-1, 1]$$

شماره ۱۰

شماره ۱۰

$$f(n) = n\sqrt{n}$$

(افزایش طول دنباله در هر بار این تابع به قدر ۲ افزایش می یابد)

$$g \circ f(n) = g(f(n)) = 2\sqrt{2n}$$

(هرگاه عددی $g(n)$ به جای n عدد قدر بسیار بزرگتری می شود)

$$\text{if } g(f(n)), f(n) = 1 \Rightarrow g(f(n)) = 2 \Rightarrow \text{if } f(n) = 1$$

$$\text{if } g(f(n)), f(n) = 2\sqrt{2} \Rightarrow g(f(n)) = 4 \Rightarrow \text{if } f(n) = 2\sqrt{2}$$

$$\Rightarrow f(n) = n\sqrt{n}$$

$$n\sqrt{n} = 1$$

$$(n = 1)$$

$$\Rightarrow f(n) = n\sqrt{n}$$

$$n\sqrt{n} = 2\sqrt{2}$$

$$(n = 2)$$

$$2 - 1 = 1$$