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۲۰ عالی نوشتن

معین نصری

کتابخانه

(۲) (۱)

$$f \circ f\left(\frac{5}{12}\right) \rightarrow f\left(f\left(\frac{5}{12}\right)\right)$$

$$f\left(\frac{5}{12}\right) \rightarrow \cos \frac{\pi}{6} = \frac{\sqrt{3}}{2} \rightarrow f\left(\frac{\sqrt{3}}{2}\right) = \sqrt{\frac{\sqrt{3}}{2} + 1} = \sqrt{\frac{\sqrt{3} + 2}{2}} = \sqrt{\frac{5}{2}} = \sqrt{2.5} = (2) \checkmark$$

$$f\left(\frac{1}{k}\right) = \sqrt{\frac{2k-1}{k^2}} \rightarrow f(k) = \sqrt{\frac{\frac{2}{k}-1}{\frac{1}{k^2}}} = \sqrt{\frac{\frac{2-k}{k}}{\frac{1}{k^2}}} = \sqrt{\frac{2-k}{k}} = f(k) \quad (2) \text{ (الف)} \quad (2) \checkmark$$

$$f(g(u)) = \Rightarrow g\left(\frac{\pi}{6}\right) = 2 \cos \frac{\pi}{6} = \frac{2}{1} = 2 \rightarrow f\left(\frac{2}{1}\right) = \sqrt{1 - \frac{1}{2}} = \sqrt{\frac{1}{2}} = \left(\frac{\sqrt{2}}{2}\right) \checkmark$$

$$f(g(\sqrt{3})) = \Rightarrow g(\sqrt{3}) = \frac{\sqrt{3}}{1-\sqrt{3}} \xrightarrow{\sqrt{3} \approx 1.73} \frac{1.73}{-0.73} = -\frac{1.73}{0.73} \approx -2.37$$

ب

$$f(-3.5) = [-2.37] = (-2.37) \checkmark$$

$$g\left(f\left(\frac{5}{12}\right)\right) = \Rightarrow f\left(\frac{5}{12}\right) = \sin \frac{\pi}{6} = \frac{\sqrt{3}}{2} \rightarrow g\left(\frac{\sqrt{3}}{2}\right) = \frac{\sqrt{3}}{2} \sqrt{1 - \left(\frac{\sqrt{3}}{2}\right)^2} = \frac{\sqrt{3}}{2} \times \frac{1}{2} = \left(\frac{1}{4}\right) \checkmark \quad (3) \quad (2) \checkmark$$

$$\text{الف) } f \circ g(u) \begin{cases} \textcircled{1} \rightarrow 2 \rightarrow \textcircled{5} \\ \textcircled{2} \rightarrow 4 \rightarrow \textcircled{5} \\ \textcircled{3} \rightarrow 8 \rightarrow \textcircled{12} \\ \textcircled{4} \rightarrow 16 \rightarrow \textcircled{12} \end{cases} \Rightarrow \{(1,5), (2,5), (3,12), (4,12)\} \checkmark$$

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$$\text{ب) } g \circ f(u) \begin{cases} 1 \rightarrow 5 \rightarrow x \\ 2 \rightarrow 4 \rightarrow x \\ 3 \rightarrow 8 \rightarrow x \\ 4 \rightarrow 16 \rightarrow x \end{cases} \Rightarrow \emptyset \checkmark$$

$$\text{ج) } f \circ f(u) \begin{cases} 1 \rightarrow 5 \rightarrow x \\ 2 \rightarrow 4 \rightarrow x \\ 3 \rightarrow 8 \rightarrow x \\ 4 \rightarrow 16 \rightarrow x \end{cases} \Rightarrow \emptyset \checkmark$$

$$\text{د) } g \circ g(u) \begin{cases} \textcircled{1} \rightarrow 2 \rightarrow \textcircled{1} \\ \textcircled{2} \rightarrow 4 \rightarrow \textcircled{2} \\ \textcircled{3} \rightarrow 8 \rightarrow \textcircled{4} \\ \textcircled{4} \rightarrow 16 \rightarrow x \end{cases} \Rightarrow \{(1,1), (2,2), (3,4)\} \checkmark$$

یادهم

معین نصری

تکلیف شماره ۹

$$(f, 2) \in f \circ g$$

$g(a) \quad f(a) \quad \emptyset$

$\textcircled{a} \rightarrow 3 \rightarrow \textcircled{2}$

$\boxed{a=3}$

$$(f, 1) \in g \circ f$$

$f(a) \quad g(a) \quad 1$

$\textcircled{a} \rightarrow 1 \rightarrow 1$

$\boxed{b=a}$

$$\Rightarrow (a, b) \rightarrow (f, d) \quad \checkmark \quad \textcircled{2} \quad \textcircled{5}$$

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$$f(u) = au + b \rightarrow f(f(u)) = a^2u + a^2b + b = 2u + 3$$

$$\Rightarrow f(u) = 2u + 1$$

$\Rightarrow \begin{cases} a=2 \\ b=1 \end{cases}$

$$\rightarrow g \circ f(-1) = g(f(-1)) \Rightarrow f(-1) = -2 + 1 = -1 \rightarrow g(-1) \rightarrow 2u + 3 = -1$$

$$2u = -4$$

$$\boxed{u = -2}$$

$$\Rightarrow g(2(-2)+3) = g(-1) = -2 - 2 = -4 \quad \checkmark \quad \textcircled{-4}$$

☆ می توانیم جای a ، حتی 2 ، b ، حتی 3 بگذاریم احاطای می است. $\checkmark$

$$D_{g \circ f} = \left\{ u \in D_f : f(u) \in D_g \right\} \rightarrow D_{f(u)} = u + |u| \geq 0 \rightarrow \checkmark$$

$\mathbb{R} \cap (0, +\infty) - \{1\}$

$\Rightarrow D_{f(u)} = \mathbb{R}$

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$$D_{g(u)} = \{ u \in \mathbb{R} : u \neq 0 \} \rightarrow u(u + u - 1) \neq 0 \rightarrow D_{g(u)} = \mathbb{R} - \{0, 1\}$$

$\Rightarrow D_{g \circ f} = (0, +\infty) - \{1\} \quad \checkmark$

$$\Rightarrow \begin{cases} \sqrt{u+|u|} \neq 0 \rightarrow u \neq (0, +\infty) \\ \sqrt{u+|u|} \neq 1 \rightarrow u \neq 1 \end{cases} \Rightarrow u = (0, +\infty) - \{1\}$$

یاد دہم سے B

میں (نصی)

کتابیں سناؤ 9

$$\begin{aligned} \text{(I)} \quad D_{g \circ f} \\ \text{(II)} \quad D_{f \circ g} \end{aligned} \left\} \xrightarrow{\text{حباب}} \underline{\underline{\quad}}$$

$$D_{g \circ f} = \{x \in D_f : f(x) \in D_g\}$$

$$[-1, 1] \cap \mathbb{R}$$

$$\downarrow$$

$$D_{g \circ f} = [-1, 1]$$

$$\sqrt{1-x^2} \geq 0 \rightarrow \sqrt{\cdot} = \mathbb{R}$$

$$D_f = 1-x^2 \geq 0 \rightarrow D_f = [-1, 1]$$

$$D_g = x \geq 0 \rightarrow D_g = [0, +\infty)$$

$$D_{f \circ f} = \{x \in D_f : f(x) \in D_f\}$$

$$[-1, 1] \cap \mathbb{R}$$

$$\downarrow$$

$$D_{f \circ f} = [-1, 1]$$

$$-1 \leq \sqrt{1-x^2} \leq 1 \rightarrow \sqrt{1-x^2} \leq 1$$

$$1-x^2 \leq 1$$

$$-x^2 \leq 0 \rightarrow x^2 \geq 0$$

$$\Rightarrow I \cap II = [-1, 1] \quad \checkmark$$

$$x = 2n+1 \rightarrow x = \frac{2n+1}{2} \rightarrow \dots \frac{2n+1}{2}$$

$$\text{الف) } f\left(\frac{3u+1}{u-2}\right) = 4u+5$$

$$\rightarrow \frac{3u+1}{u-2} = t \rightarrow u = \frac{t+1}{t-3}$$

$$\rightarrow u = \frac{2t+1}{t-3}$$

$$\Rightarrow f(t) = \frac{12t+5}{t-3} + 5 \rightarrow \frac{12t+5+5t-15}{t-3} = \frac{17t-10}{t-3}$$

$$\Rightarrow f(u) = \frac{17u-10}{u-3} \quad \checkmark$$

$$\boxed{u + \frac{1}{u} = t} \rightarrow u^3 + \frac{1}{u^2} + 3u + \frac{3}{u} = \dots$$

$$\text{ب) } f\left(u + \frac{1}{u}\right) = u^3 + \frac{1}{u^3}$$

$$\rightarrow u^3 + \frac{1}{u^3} = \left(u + \frac{1}{u}\right)^3 - 3\left(u + \frac{1}{u}\right)$$

$$u^3 + \frac{1}{u^3} = t^3 - 3t$$

$$\Rightarrow f(t) = t^3 - 3t$$

$$\Rightarrow f(u) = u^3 - 3u \quad \checkmark$$

$$g(u) < \frac{1}{2\sqrt{2}}$$

$$u \xrightarrow{f(u)} 1 \xrightarrow{g(u)} 0$$

$$u' \xrightarrow{f(u)} 2\sqrt{2} \xrightarrow{g(u)} 0$$

$$\Rightarrow f(u) = u\sqrt{u} \begin{cases} u\sqrt{u} = 2\sqrt{2} \rightarrow \boxed{u=2} \quad \checkmark \\ u\sqrt{u} = 1 \rightarrow \boxed{u=1} \quad \checkmark \end{cases} \quad \textcircled{10} \quad \textcircled{2}$$

$$\Rightarrow \frac{f(u)}{u} = \sqrt{u} \text{ تابع } f(u)$$

تابع صوری شود

$$\Downarrow$$

$$2-1 = \textcircled{1} \quad \checkmark$$