نام و نام خانوادگی ...ایلیا مسلمی... پاسخنامه تشریحی تکلیف شماره ...۹... کلاس ...یازدهم تجربی A...

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$f(\frac{2}{3}) = \cot \frac{\frac{2\pi}{3}}{4} = \cot \frac{\pi}{6} = \sqrt{3}$ ، $\frac{2}{3} < 1$

$f\circ f(\frac{2}{3}) = f(\sqrt{3}) = \sqrt{3+1} = 2$ ، $\sqrt{3} > 1$

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الف) $g(\frac{\pi}{3}) = 2 \times \cos^2 \frac{\pi}{3} = \frac{1}{2} \to f(\frac{1}{2}) = \sqrt{\frac{4-1}{4}} = \sqrt{\frac{3}{4}} = \frac{\sqrt{3}}{2}$

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

$f(-\sqrt{2}-2) = [-\sqrt{2}-2] = [-\sqrt{2}]-2 = -2-2 = -4$

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$f(\frac{\pi}{4}) = \sin \frac{\pi}{4} = \frac{\sqrt{2}}{2}$

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

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الف) $f\circ g(x) = \{(4,5),(2,5),(6,12),(8,12)\}$

ب) $g\circ f(x) = \varnothing$

ج) $f\circ f(x) = \varnothing$

د) $g\circ g(x) = \{(4,8),(2,6),(6,10)\}$

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$(3,2) \in f\circ g \Rightarrow 2 \in R_f,\ 3 \in D_g \Rightarrow (a,3) \to (3,2) \Rightarrow a = 4$

$(4,1) \in g\circ f \Rightarrow 1 \in R_g,\ 4 \in D_f \Rightarrow (4,5) \to (b,1) \Rightarrow b = 5$

$\Rightarrow (a,b) = (4,5)$

$f(x)=ax+b \Rightarrow f(f(x))=a(ax+b)+b=4x+3$

$\Rightarrow a^2x+ab+b=4x+3 \Rightarrow \begin{cases} a^2=4 \Rightarrow a=\pm 2 \\ b(a+1)=3 \end{cases}$

if $a=2 \Rightarrow b=1 \Rightarrow f(x)=2x+1$

if $a=-2 \Rightarrow b=-3 \Rightarrow f(x)=-2x-3$

$g(x)=cx+d \rightarrow c(2x+3)+d=2x-1 \Rightarrow 2cx+3c+d=2x-1$

$\Rightarrow \begin{cases} 2c=2 \Rightarrow c=1 \\ 3c+d=-1 \Rightarrow \frac{9}{2}+d=-1 \Rightarrow d=-\frac{11}{2} \end{cases} \Rightarrow g(x)=\frac{2}{2}x-\frac{11}{2}$

$f(-1)=-1$

$\rightarrow g(-1)=\frac{-11}{2}=-1$

$g\circ f(-1)=-1$ ✓ 4

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

$D_f=\mathbb{R}$

$x^2-4x=x(x-4)\Rightarrow x=\begin{cases}0\\4\end{cases} \Rightarrow D_g=\mathbb{R}-\{0,4\}$

$\Rightarrow D_{g\circ f}=\{x\in\mathbb{R},\ \sqrt{x+|x|}\neq\{0,4\}\}$

$x>0,\ x\neq 1 \Rightarrow D_{g\circ f}=(0,+\infty)-\{1\}$ 2

$D_f=[-1,1] \Rightarrow D_{f+g}=[0,1)$

$D_g=[0,+\infty)$

$D_{(f+g)\circ f}=\{x\in D_f : f(x)\in D_{f+g}\}=\{-1\le x\le 1,\ 0\le\sqrt{1-x^2}<1\}$

$\Rightarrow 0\le 1-x^2<1 \Rightarrow 1\ge x^2>0 \Rightarrow -1\le x<0 \text{ ؛ } 0<x\le 1$

$\Rightarrow D_{(f+g)\circ f}=[-1,0)\cup(0,1]$ 1

(ب) $\frac{2x+1}{x-2}=t \Rightarrow 2x+1=tx-2t \Rightarrow x(2-t)=-(2t+1)$

$\Rightarrow x=\frac{2t+1}{t-2} \Rightarrow ft=f\left(\frac{2t+1}{t-2}\right)+0=\frac{12t-11}{t-2} \Rightarrow f(x)=\frac{12x-11}{x-2}$

$\hookrightarrow f\left(x+\frac{1}{x}\right)=\left(x+\frac{1}{x}\right)^3-2\left(x+\frac{1}{x}\right) \Rightarrow f(x)=x^3-2x$ 9

$g\circ f=0 \rightarrow \begin{cases} f(x)=1 \Rightarrow x\sqrt{x}=1 \Rightarrow x=1 \\ f(x)=2\sqrt{2} \Rightarrow x\sqrt{x}=2\sqrt{2} \Rightarrow x=2 \end{cases}$

$2-1=1$ ✓ 10