نام و نام خانوادگی .... پاسخنامه تشریحی تکلیف شماره ....9.... کلاس ....B..........

$\cot\frac{\pi x}{4}$ $x\le 1$; $\sqrt{x^2+1}$ $x>1$; $f\circ f(\frac{2}{3}) = f(f(\frac{2}{3}))$; $x=\frac{2}{3} \to \cot(\frac{\pi}{4}\times\frac{2}{3}) = \cot(\frac{\pi}{6}) = \sqrt{3}$; $x=\sqrt{3}$: $f(\sqrt{3}) \to \sqrt{(\sqrt{3})^2+1} = 2$	۱
$f(\frac{1}{x}) = \sqrt{\frac{2x-1}{x}}$ $g(x) = 2\cos^2 x$ $f\circ g(\frac{\pi}{3}) = f(g(\frac{\pi}{3}))$; $g(\frac{\pi}{3}) = 2(\frac{1}{2})^2 = \frac{1}{2}$; $f(\frac{1}{2}) = \sqrt{\frac{3}{4}} = \frac{\sqrt{3}}{2}$ $f(\frac{\pi}{3}) = \frac{\sqrt{3}}{2}$; $f(x) = [x]$ $g(x) = \frac{x}{1-x}$; $f(\frac{\sqrt{2}}{1-\sqrt{2}}) = [\frac{\sqrt{2}}{1-\sqrt{2}}] = [-(2+\sqrt{2})]$; $f\circ g(\sqrt{2}) = [-2-\sqrt{2}] = -4$	۲
$g\circ f(\frac{\pi}{4}) =$; $g(\frac{\sqrt{2}}{2}) = \frac{\sqrt{2}}{2}\sqrt{1-\frac{1}{2}} = \frac{1}{2} \to g(\frac{\sqrt{2}}{2}) = \frac{1}{2}$; $f(\frac{\pi}{4}) = \sin(\frac{\pi}{4}) = \frac{\sqrt{2}}{2}$; $g\circ f(\frac{\pi}{4}) = g(\frac{\sqrt{2}}{2}) = \frac{1}{2}$	۳
$f\circ g$: $4 \xrightarrow{g} 6 \xrightarrow{f} 5$; $6 \to 8 \to 12$; $8 \to 10 \to 12$; $2 \to 4 \to 5$; $f\circ g = \{(4,5),(6,12),(8,12),(2,5)\}$; $4 \to 5 \to \varnothing$; $6 \to 5 \to \varnothing$; $8 \to 12 \to \varnothing$; $10 \to 12 \to \varnothing$; $g\circ f = \varnothing$	۴
$f\{(2,1),(3,2),(4,5),(1,7)\}$ $g = \{(1,2),(3,1),(4,3),(b,1)\}$; $(4,2) \in f\circ g$ $(4,1) \in g\circ f$; $4 \to x \to 2 \to x = 3$ $(a,3)$ $a=4$; $4 \to 5 \to 1 \to (b,1) \to$ $b=5$; $(a,b) = (4,5)$	۵

$f(x)=ax+b \to fof(x)=a(ax+b)+b$

$fof(x)=4x+c = a^2x+ab+b \quad \begin{cases} a=\pm 2 \\ ab+b=c \end{cases} \to \begin{cases} 2x+c=-1 \\ x=-4 \end{cases}$ ۶

$a \to -2 \quad -2x-c \xrightarrow{x=-1} -1$

$a \to 2 \to f(x)=-2x-c \xrightarrow{x=-1} =+1 \Big\} \; f(-1)=-1$

$g(-1)=-8 \qquad gof(-1)=g(-1)=-8$

$f(x)=\sqrt{x+|x|} \Rightarrow f(x)=\begin{cases} 0 & x\le 0 \\ \sqrt{2x} & x>0 \end{cases} \to D_f=\mathbb{R}$

$g(x)=\dfrac{1}{x^2-4x} \qquad f(x)\neq 0 \qquad f(x)\neq 4$ ۷

$f(x)=0 \to x\le 0 \qquad f(x)=4 \quad x+|x|=16 \quad 2x=16 \quad x=8$

$D_{gof}\ \{x\in D_f,\ f(x)\in D_g\}=(0,8)\cup(8,+\infty)=(0,+\infty)-\{8\}$

$f(x)=\sqrt{1-x^2} \qquad g(x)=\sqrt{x} \qquad f(x)=\sqrt{1-x^2} \to 1-x^2\ge 0$

$(f+g)of=f(f(x))+g(f(x)) \qquad -1\le x\le 1 \quad D_f[-1,1]$ ۸

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$gof(x)=0 \qquad g[f(x)]=0 \qquad (2\sqrt{2},1)$

$g(f(x))=0 \to \begin{cases} f(x)=2\sqrt{2} & x\sqrt{x} \to x=2 \\ f(x)=1 & x\sqrt{x} \to x=1 \end{cases}$ ۱

$2-1=1$