۱۴٫۵

ریاضی ۲ سمی

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$\sqrt{(\sqrt{3})^2+1}=2 \Rightarrow f(f(\frac{\pi}{6}))=2$ ✓ ۲

$\cot\frac{\pi}{6}$

۲-

$2(\frac{1}{2})^2=\frac{1}{2} \Rightarrow f(\frac{1}{2})=\sqrt{12}=2\sqrt{3} \Rightarrow f\circ g(\frac{\pi}{4})=2\sqrt{3}$ الف

$f(\frac{1}{2})=\frac{\sqrt{3}}{2}$

$\frac{\sqrt{2}\cdot(1-\sqrt{2})}{-1}=\sqrt{2}-2 \xrightarrow{f(\sqrt{2}-2)} [-\sqrt{2}-2]=-4$ ✓ ب ۱٫۵

۳-

$f(\frac{\pi}{4})=\frac{\sqrt{2}}{2} \Rightarrow g(\frac{\sqrt{2}}{2})=\frac{\sqrt{2}}{2}\times\frac{\sqrt{2}}{2}=\frac{1}{2}$ ✓ ۲

۴-

الف) $4\to 6\to 5$, $2\to 4\to 5$, $6\to 8\to 12$, $8\to 10\to 12$ $\Rightarrow \{(4,5)(2,5)(6,12)(8,12)\}$ ✓

ب) $4\to 5\to \varnothing$, $6\to 5\to \varnothing$, $8\to 12\to \varnothing$, $10\to 12\to \varnothing$ $\Rightarrow \varnothing$ ✓ ۲

ج) $4\to 5\to \varnothing$, $6\to 5\to \varnothing$, $8\to 12\to \varnothing$, $10\to 12\to \varnothing$ $\Rightarrow \varnothing$ ✓

د) $4\to 6\to 8$, $2\to 4\to 6$, $6\to 8\to 10$, $8\to 10\to \varnothing$ $\Rightarrow \{(4,8)(2,6)(6,10)\}$ ✓

۵ -

$a=4$
$b=5$ $\} \to (4,5)$ ✓ ۲

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۶ - ۱

$a=\pm 2 \to 2b=2 \Rightarrow b=1 \Rightarrow 2x+1$
$ \to -b=2 \Rightarrow b=-2 \Rightarrow -2x-2$

$2c=3 \to c=\frac{3}{2} \Rightarrow \frac{9}{2}+d=-3 \Rightarrow d=-\frac{15}{2} \Rightarrow \frac{3}{2}x-\frac{15}{2}$

$\Rightarrow \frac{3}{2}(-1)-\frac{15}{2}=-9$ $\quad g(x)=\frac{3x-9}{2}-2$

$\frac{3}{2}(-3)-\frac{15}{2}=-\frac{19}{2}$ $\quad f(-1)=-1 \to g(-1)=-8$

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۷ - ۰

$D_{gof}=\{x\in D_f \mid f(x)\in D_g\}$

$x+|x|=0 \Rightarrow R^- \cup \{0\}$ $\quad x \to 0,\ 4$

$D_f=\mathbb{R}$

$\sqrt{x+|x|}=2 \Rightarrow x=2$

$D_g=\mathbb{R}-\{0,4\} \Rightarrow \mathbb{R}-\{R^-\cup\{0\}\cup\{2\}\}$

$f(x)\neq 0,4$
$\begin{cases}\sqrt{x+|x|}\neq 0 \to x>0\\ \sqrt{x+|x|}\neq 4 \to x\neq 8\end{cases}$

$D_{gof}=(0,+\infty)-\{8\}$

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۸ -

$\sqrt{1-\sqrt{1-x^2}}+\sqrt{\sqrt{1-x^2}}, \quad -1\leq x\leq 1$

$\sqrt{1-x^2}\leq 1 \Rightarrow x^2\geq 0 \Rightarrow [-1,1]$ ✓ ۲

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۹ -

$x=\frac{2t+1}{t-3} \Rightarrow \frac{12t-11}{t-3} \Rightarrow f(x)=\frac{12x-11}{x-3}$ ✓

$\to (x+\frac{1}{x})((x+\frac{1}{x})^2-3) \Rightarrow f(x)=x(x^2-3)$ ✓ ۲

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۱۰ -

$f(x)=1 \Rightarrow x=1$
$f(x)=2\sqrt{2} \Rightarrow x=2$ $\} \to |2-1|=1$ ✓ ۲