نام و نام خانوادگی ......[illegible]...... پاسخنامه تشریحی تکلیف شماره ..۸.... کلاس ..[illegible]........

$f(x)=\sqrt{\log_2^{(x-1)}} \Rightarrow \log_2^{x-1} \geq 0 \Rightarrow x-1 \geq 1 \Rightarrow x \geq 2$; $x-1>0 \Rightarrow x>1$ $\Big\} \cap \; x \geq 2$

$g(x)=\sqrt{-x^2+4x-4} \Rightarrow x^2-4x+4 \leq 0 \Rightarrow (x-2)^2 \leq 0 \Rightarrow x=2$

$D_{gof(x)} = \{x \in D_f \mid f(x) \in D_g\} = \{x \geq 2 \cap \sqrt{\log_2^{x-1}} = 2 \Rightarrow x-1=16 \Rightarrow x=17\} \Rightarrow$ ۱

$D_{gof(x)} = \{17\}$

$f(x)=2x-5 \quad g(x)=x^2-3x+8$

$gof(x)=g(2x-5)=(2x-5)^2-3(2x-5)+8=4x^2-26x+48$ $\quad \frac{800+208}{16}=\boxed{63}$

$fog(x)=f(x^2-3x+8)=2(x^2-3x+8)-5=2x^2-6x+11$ ۲

$gof(x)=fog(x) \Rightarrow 4x^2-26x+48 \Rightarrow 2x^2+37-20x=0$ = جمع

$x=\frac{20 \pm \sqrt{104}}{4}$ $\begin{cases} x_1=\frac{20+\sqrt{104}}{4} \\ x_2=\frac{20-\sqrt{104}}{4} \end{cases}$ به توان ۲ $\quad \frac{400+104+40\sqrt{104}}{16}, \frac{400+104-40\sqrt{104}}{16}$

$gof(x)=5x^2+11 \Rightarrow g(2x)=5x^2+11 \Rightarrow 2x=t \Rightarrow x=\frac{t}{2} \Rightarrow \frac{5}{4}t^2+11 \Rightarrow g(x)=\frac{5}{4}x^2+11$

$\frac{5}{4}(x-7)^2+11 \Rightarrow \frac{5}{4}(x^2-14x+49)+11=\frac{5}{4}x^2-\frac{35}{2}x+\frac{289}{4}=5x^2-70x+289$ ۳

$fog(x)=3x^2-6x-1$; $f(x)=3x-4$ $\Big\} f(g(x))=3g(x)-4 \Rightarrow 3x^2-6x-1=3g(x)-4 \Rightarrow g(x)=x^2-2x+1=(x-1)^2$ ۴

$g(f(x))=g(3x-4)=(3x-4-1)^2=9x^2+25-30x$

$2g(x)=3f(x)-14 \; *$ $\Big\} \; 2g(x)=3(g(x)-x+5)-14$

$f(x)-g(x)=-x+5 \Rightarrow f(x)=g(x)-x+5$ ۵

$\Rightarrow 2g(x)=3g(x)-3x+15-14 \Rightarrow g(x)=3x-1 \overset{*}{\Rightarrow} f(x)=3x-1-x+5=2x+4$

$f(g(x))=f(3x-1)=2(3x-1)+4=6x+2 \Rightarrow 6x+2=0 \Rightarrow x=\boxed{\frac{-1}{3}=a}$

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الی طباطبایی

$f(x)=9^x$

$g(x)=\log_3^x \rightarrow x>0$ (1)

$\boxed{(1)\cap(2)=(0,2]}$

$f\circ g(x)=f(\log_3^x)=9^{\log_3^x}=x^{\cancel{\log_3^9}\,2}=x^2$

$g\circ f(x)=g(9^x)=\log_3^{9^x}=2x$

$\left.\right\} f\circ g(x)\leq g\circ f(x) \Rightarrow x^2\leq 2x \Rightarrow$

$x^2-2x\leq 0 \Rightarrow x(x-2)\leq 0 \Rightarrow 0\leq x\leq 2$ (2) 6

$f\left(\frac{x^2-2}{x}\right)=x^2+x-4-\frac{2}{x}+\frac{4}{x^2} \Rightarrow f\left(x-\frac{2}{x}\right)=\underbrace{\left(x-\frac{2}{x}\right)}_{t}^2+x-\frac{2}{x}$

$f(t)=t^2+t \Rightarrow \boxed{f(x)=x^2+x}$ 7

$f\circ g=f(g(x))=f(8x-x^2)=\log_2^{8x-x^2}$

$8x-x^2>0 \Rightarrow x(8-x)>0$ $\quad$ 0 8: $-\ |\ +\ |\ -$ $\Rightarrow \underset{=}{\overset{A}{D_f}}=(0,8)\,,\ \underset{=}{\overset{B}{R_f}}=\mathbb{R}$ 8

$\boxed{A\cap B=(0,8)}$

$h(g(x))=h(x-1)=(x-1)^3+2(x-1)+1=x^3-3x^2+3x+2x-2+1$

$=x^3-3x^2+5x-1=f(x)$ 9

$f(x)=x-\frac{4}{x}$

$g\circ f(x)=ax^3+2x$ $\left.\right\} g(f(x))=g\left(x-\frac{4}{x}\right)=ax^3+2x$ 10

$x-\frac{4}{x}=3 \Rightarrow x^2-3x-4=0 \Rightarrow (\underset{4}{x-4})(\underset{-1}{x+1})=0$

If $x=4 \Rightarrow 64a+8=8 \Rightarrow \boxed{a=0}$

If $x=-1 \Rightarrow -a-2=8 \Rightarrow \boxed{a=-10}$

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