نام و نام خانوادگی ....طاها حق جوی..... پاسخنامه تشریحی تکلیف شماره ..۸.. کلاس دوازدهم پسر ..A..

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$D_{gof}=\{x \mid x\in D_f , f(x)\in D_g\}$ $\quad D_f \begin{cases} x-1>0 \to x>1 \\ \log_2^{x-1}\geq 0 \to x-1\geq 1 \to x\geq 2 \end{cases} \to x\geq 2$

$D_g: -x^2+4x-4\geq 0 \longrightarrow \begin{array}{c|ccc} & & 2 & \\ \hline -(x-2)^2 & - & 0 & - \end{array} \Rightarrow x=2 \Rightarrow f(x)=2=\sqrt{\log_2^{x-1}}$

$\to 4=\log_2^{x-1} \to x-1=2^4=16 \longrightarrow D_{fog}=\{17\}$

$\downarrow$

$x=17$

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$fog(x)=2x^2-6x+16-5=2x^2-6x+11$

$gof(x)=(2x-5)^2-3(2x-5)+8=4x^2-26x+48$

$fog(x)=gof(x) \Rightarrow 4x^2-26x+48=2x^2-6x+11 \to 2x^2-20x+37=0$

$\left.\begin{array}{l} x_1+x_2=-\frac{-20}{2}=+10 \\ x_1.x_2=\frac{37}{2} \end{array}\right\} \longrightarrow (x_1+x_2)^2-2x_1.x_2=x_1^2+x_2^2=(10)^2-2\left(\frac{37}{2}\right)=\underline{\underline{63}}$

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$f(x)=2x=t \to \frac{t}{2}=x \to g(t)=5\left(\frac{t}{2}\right)^2+11=\frac{5t^2}{4}+11$

$\to g(x-7)=\frac{5(x^2-14x+49)+44}{4}=\frac{5x^2-70x+289}{4} \longrightarrow -\frac{b}{2a}=\frac{\frac{70}{4}}{\frac{5}{2}}=7$

$\longrightarrow \frac{5(49)-70(7)+289}{4}=\underline{\underline{11}}$

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$3g(x)-4=3x^2-6x-1 \to 3g(x)=3x^2-6x+3 \to g(x)=x^2-2x+1$

$gof(x)=(3x-4)^2-2(3x-4)+1=9x^2-30x+35$

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$f-g(x)=-x+5 \;,\; fog(x)=\frac{2x}{-a}+2 \;,\; g(x)=\frac{3}{2}f(x)-7$

$\to f-g(x)=f(x)-\left[\frac{3}{2}f(x)-7\right]=-\frac{f(x)}{2}+7=-x+5 \to f(x)=2x+4$

$\to g(x)=3x-1 \longrightarrow fog(x)=2[3x-1]+4=6x+2=\frac{2}{-a}+2$

$\to \boxed{a=-\frac{1}{3}}$

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$fog(x) = \log_{2}^{8x-x^{2}} \rightarrow 8x - x^{2} > 0 \rightarrow D_{fog} = (0,8) = A$

$8x - x^{2} \xrightarrow{D_{fog}} 0 < 8x - x^{2} \leq 16 \rightarrow \log_{2}^{8x-x^{2}} \leq 4 \rightarrow R_{fog} = (-\infty, 4] = B$

$A \cap B = (0,4] \Longrightarrow \{1,2,3,4\} \rightarrow$ ۴ تا

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

$x = 4$ یا $x = -1$

$\rightarrow g(3) = 8 \rightarrow \begin{cases} x = 4 \rightarrow g(3) = a \times 4^{3} + 2 \times 4 = 64a + 8 = 8 \rightarrow \boxed{a = 0} \\ \text{یا} \\ x = -1 \rightarrow g(3) = a \times (-1)^{3} - 2 = -a - 2 = 8 \rightarrow \boxed{a = -10} \end{cases}$

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