نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ۰۰۸ کلاس ..... نوبت .....

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$D_{gof} = \{x \in D_f , f(x) \in D_g\}$ $\sqrt{g_{\frac{2}{2}}^{(x-1)}}$ → $x-1 > 0$ $x > 1$ ①

$f(x) = \sqrt{-(x-2)^2}$ → $-(x-2)^2 \geq 0$ → $(x-2)^2 = 0$ $x = 2$ $D_g = \{2\}$

$\sqrt{g_{\frac{2}{2}}^{(x-1)}} = 2$ $g_{\frac{2}{2}}^{x-1} = 4$ $x-1 = 2^4 = 16$ $x = 17$ ②

① ∩ ② → $(1, +\infty) \cap \{17\} = D_{gof} = \{17\}$

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$fog(x) = 2(x^2 - 3x + 8) - 5 = 2x^2 - 6x + 16 - 5 = 2x^2 - 6x + 11$

$gof(x) = (2x-5)^2 - 3(2x-5) + 8 = 4x^2 - 24x + 48$

$fog(x) = gof(x)$ → $2x^2 - 6x + 11 = 4x^2 - 24x + 48$ → $-2x^2 + 20x - 37 = 0$

$\alpha^2 + \beta^2 = (\alpha+\beta)^2 - 2\alpha\beta = \left(\frac{20}{2}\right)^2 - 2\left(\frac{37}{2}\right) = 100 - 37 = \boxed{63}$

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$gof = 5x^2 + 11$ $f(x) = 2x$ $2x = 1$ $x = \frac{1}{2}$

$g(1) = 5\left(\frac{1}{2}\right)^2 + 11 = \frac{5}{4} + 11$ → $g(x) = \frac{5}{4}x^2 + 11$

$g(x-1) = \frac{5}{4}(x-1)^2 + 11 = \frac{5}{4}(x^2 - 2x + 1) + 11 = \frac{5}{4}x^2 - \frac{5}{2}x + \frac{49}{4}$

$-\frac{b}{2a} = \frac{\frac{5}{2}}{2 \times \frac{5}{4}} = \frac{5 \times 4}{2 \times 2 \times 5} = 1$ → کمترین مقدار $y = 11$

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$f(x) = 3x - 4$, $fog(x) = 3x^2 - 6x - 1$ → $3g - 4 = 3x^2 - 6x - 1$

$g = x^2 - 2x + 1 = (x-1)^2$ → $gof = g(f(x)) = (3x-4-1)^2 = (3x-5)^2 =$

$gof(x) = 9x^2 - 30x + 25 = (3x-5)^2$

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$f(x) - g(x) = -x + 5$) $\times -2$ → $-2f(x) + 2g(x) = 2x - 10$ ↗ +

بازگشت به مجهول اول ← $3f(x) - 2g(x) = 14$ ← $3f(x) - 2g(x) = 14$

$f(x) = 2x + 4$

$g(x) = 3x - 1$

$fog(x) = 2(3x-1) + 4 = 6x + 2$

$6x + 2 = 0$ → $6x = -2$ $x = \boxed{-\frac{1}{3} = \alpha}$

$f(x)=9^x$, $g(x)=\log_3^x$ $\quad fog(x) \le gof(x) \rightarrow 9^{\log_3^x} \le \log_3^{9^x}$

$\log_3^{9^x} \le \log_3^{9^x} \rightarrow x^2 \le 2^x \longrightarrow x=\{0,1,2,\}$ $\quad$ ۳ عضو

$f(\frac{x^2-2}{x}) = x^2+x-4-\frac{2}{x}+\frac{4}{x^2} \longrightarrow f(x)=x+x^2$

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

$f(x)=\log_2^x$, $g(x)=8x-x^2$ $\quad A\cap B = D_{fog} \cap R_{fog} \neq (0,4)$

$fog(x) = f(g(x)) = \log_2^{8x-x^2} = \log_2^x + \log_2^{8-x}$ $\quad$ شامل ۳ عدد صحیح

$D = 8x-x^2>0 \quad x^2-8x<0 \quad x(x-8) \quad \overset{0}{-} \quad \overset{8}{+} \quad \overset{0}{-} \rightarrow D=(0,8)$

$\rightarrow R=(-\infty,4)$

$f(f(x)) = 1-2f^2(x)$ $\quad f(x)=t \rightarrow f(t)=1-2t^2 \rightarrow f(x)=1-2x^2$

$g(x)=x-1$

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

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

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

$x^3-5x-3=0 \longrightarrow$ ۳ جواب دارد

$f(x)=x-\frac{4}{x}$ $\quad gof(x)=ax^3+2x \longrightarrow g(x-\frac{4}{x})=ax^3+2x$ $\quad g(3)=1$

$x-\frac{4}{x}=3 \longleftarrow (x-4)(x+1)=x^2-3x-4=0$ $\quad ax^3+2x=1$

$x=\begin{cases}4 \longrightarrow 64a+8=1 \rightarrow a=0\\ -1 \longrightarrow -a-2=1 \rightarrow a=-1\end{cases}$