نام و نام خانوادگی ...[illegible]... ۱۹ پاسخنامه تشریحی تکلیف شماره ...۸... کلاس ...[illegible]...

$D_f: x-1>0 \to x>1$ $\log_2^{(x-1)} \geq 0 \to x-1 \geq 1 \to x \geq 2$ $\Big\} \to D_f = [2, +\infty)$ $D_{gof} = \{10\}$ $D_g \to -(x-2)^2 \geq 0 \to \boxed{x=2}$ $D_{gof} = D_f \Rightarrow [2,+\infty)$, $f(x) \in D_g \to \sqrt{\log_2^{x-1}} = 2 \to x-1 = 16 \to x = 17$ ۲	۱
$fog(x) = 2(x^2-3x+8) - 5 = 2x^2 - 6x + 11$ $gof(x) = (2x-5)^2 - 3(2x-5) + 8 = 4x^2 - 26x + 48$ $fog(x) = gof(x)$ $2x^2 - 6x + 11 = 4x^2 - 26x + 48 \to$ $2x^2 - 20x + 37 = 0 \to \alpha^2 + \beta^2 = (\alpha+\beta)^2 - 2\alpha\beta \to \alpha^2 + \beta^2 = 63$ $\alpha + \beta = 10 \quad \alpha\beta = \frac{37}{2}$ ۲	۲
$g(f(x)) = 5x^2 + 11$ $g(2x) = 5x^2 + 11$, $2x = t$ $\to g(t) = \frac{5}{4}t^2 + 11$ $g(x) = \frac{5}{4}x^2 + 11$ $g(x-7) = \frac{5}{4}(x-7)^2 + 11 \xrightarrow{\text{رأس}} (7, 11)$ $min = 11$ ۲	۳
$fog(x) = f(g(x)) = 3g(x) - 4$ $3g(x) - 4 = 3x^2 - 6x - 1$ $g(x) = x^2 - 2x + 1$ $g(x) = (x-1)^2$ $gof(x) = g(3x-4) = (3x-4-1)^2$ $gof(x) = 9x^2 - 30x + 25$ ۲	۴
$2(g(x)) = 3f(x) - 14 \to g(x) = \frac{3}{2}f(x) - 7$ $f - g = -x + 5 \to f(x) - \frac{3}{2}f(x) + 7 = -\frac{1}{2}f(x) + 7 = f - g(x)$ $\Rightarrow -\frac{1}{2}f(x) + 7 = -x + 5 \quad f(x) = 2x + 4$ $g(x) = \frac{3}{2}(2x+4) - 7 \to g(x) = 3x - 1$ $fog(x) = 0 \to 6x + 2 = 0 \to x = -\frac{1}{3}$ $a = -\frac{1}{3}$ ۲	۵

$fog(x) = 9^{\log_3 x} \to x^{\log_3 9} = x^2$ $\qquad fog(x) \leq gof(x)$ ۶

$x^2 \leq 2x$

$gof(x) = \log_3 9^x \to \log_3 3^{2x} = 2x$ $\qquad x^2 - 2x \leq 0$

$\begin{array}{c|ccc} & 0 & & 2 \\ \hline + & 0 & - & 0 \; + \end{array} \to x \in [0, 2]$

۰، ۱، ۲ ← ۳ تا عدد صحیح

۲

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

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$\frac{x^2-2}{x} = x - \frac{2}{x} \xrightarrow{\text{تغییر}}$ $\qquad \Rightarrow \left(x - \frac{2}{x}\right)^2 + \left(x - \frac{2}{x}\right) = \left(x^2 - 4 + \frac{4}{x^2}\right) + (x) - \frac{2}{x}$ ۷

$\left(x - \frac{2}{x}\right)^2 = x^2 - 4 + \frac{4}{x^2}$ $\qquad f\left(x - \frac{2}{x}\right) = \left(x - \frac{2}{x}\right)^2 + \left(x - \frac{2}{x}\right)$

$f(x) = x^2 + x$

$fog(x) = \log_2^{-x^2+8x} \longrightarrow D_{fog} = \cancel{D_g}^{R}, \; g \in D_f = (0, 8)$ $\Big\} \to A \cap B = (0, 4]$

۱

$R_{fog} = \mathbb{R} \to A \cap B = (0, 8)$ $\qquad R_{fog} = (-\infty, 4]$ $\qquad$ ۴ عدد صحیح ۸

$-x^2 + 8x > 0 \qquad \begin{array}{c|ccc} & 0 & & 8 \\ \hline - & 0 & + & 0 \; - \end{array} \Rightarrow 1, 2, 3, 4, 5, 6, 7 \longrightarrow$ ۷ عدد صحیح

$fof(x) = 1 - 3f^2(x) \Rightarrow f(f(x)) = 1 - 3f^2(x) \Rightarrow f(x) = 1 - 3x^2$

$h(g(x)) = h(x-1) \to (x-1)^3 + 3(x-1) + 1 \to (x-1)^3 + 3x - 1$ ۹

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

۲

$x^3 + 6x - 3 = 0 \to x^3 - 3 \neq 6x \to$ $\boxed{\text{غیرقابل حل}}$

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

$gof(x) = ax^3 + 2x$ $\Bigg\} \Rightarrow g\left(x - \frac{4}{x}\right) = ax^3 + 2x$ $\qquad$ ۲ $\qquad$ ق ق ل

$g(3) = 8$ $\qquad g(3) = 8$ $\qquad x = -1 \to -a - 2 = 8 \to a = -10$ ۱۰

$x - \frac{4}{x} = 3 \xrightarrow{\times x} x^2 - 3x - 4 = 0 \to x = 4 \to 64a + 8 = 8 \to a = 0$

$\cancel{\text{غ ق ق}}$