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

۱۹/۷۵ آفرین ۱۱

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

$D_f = (1,+\infty)$

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

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

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

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

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

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

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

۳) $gof = 5x^2+11$ $f(x) = 2x$ $2x = 4$ $x = \frac{4}{2}$

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

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

$-\frac{b}{2a} = \frac{\frac{5}{2}}{2\times\frac{5}{4}} = \frac{5\times4}{2\times2\times5} = 1$ → $y = 11$ تمرین شود

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

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

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

۵) $f(x) - g(x) = -x+5$ ) ×2 → $-2f(x)+2g(x) = 2x-10$ ↘ +

با کمک بگیرید از ← $3f(x) - 2g(x) = 14$ → $3f(x) - 2g(x) = 14$

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

$6x+2=0$ → $6x=-2$ $x = -\frac{1}{3} = a$ $g(x) = 3x-1$

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

$\log_3 9^x \le \log_3 9^{x^2} \rightarrow x^2 \le 2^x \longrightarrow x=\{0,1,2,\}$ ✓ $\quad$ ۳ عضو ✓ $\quad$ ۶

(۲)

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

$f\left(x-\frac{2}{x}\right)=\underbrace{x^2-4+\frac{4}{x^2}}_{x^2}+\underbrace{x-\frac{2}{x}}_{x}$ ✓ $\quad$ ۷

(۲)

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

$fog(x)=f(g(x))=\log_2^{8x-x^2}=\log_2^x+\log_2^{8-x}$ $\quad$ شامل ۳ عدد صحیح ✓ $\quad$ ۸

$D=8x-x^2>0 \quad x^2-8x<0 \quad x(x-8) \quad {}^{-}_{+}\,{}^{0}_{1}\,{}^{+}_{-}\,{}^{8}_{1} \rightarrow D=(0,8)$

$\rightarrow R=(-\infty,4)$ ✓ $\quad$ (۲)

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

$g(x)=x-1$

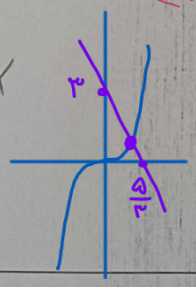
$h(x)=x^3+2x+1$

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

$h(g(x))=f(x)$ $\rightarrow x^3-3x^2+3x-1+2x-2+2=-2x^2+1$ $\quad$ ۹

$x^3=-5x+3$

$x^3+5x-3=0 \longrightarrow$ جواب دارد ✗ (۱) ✓ $\quad$ (۱/۵)




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

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

$(x-4)(x+1)=x^2-3x-4=0$ $\quad$ ۱۰

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

(۲)