نام و نام خانوادگی ...آرین ... پاسخنامه تشریحی تکلیف شماره ...۸... کلاس ...دوازدهم ریاضی...

$D_{g(f(x))} = ? = \{x \in D_f \mid R_f \in D_g\}$

$D_f = x \geq 1$, $\log_2 (x-1) \geq 0 \Rightarrow 1 \leq x-1 \Rightarrow x \geq 2 \Rightarrow \boxed{x \geq 2}$ ۱

$D_g = x^2 - 4x + 4 \leq 0 \Rightarrow (x-2)^2 \leq 0 \Rightarrow x = 2$

$D_{g(f(x))} = x \geq 2 \mid \sqrt{\log_2 (x-1)} = 2 \Rightarrow \log_2 (x-1) = 4 \Rightarrow x-1 = 16 \Rightarrow x = 17 \Rightarrow D_{g(f(x))} = \{17\}$

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

$f(g(x)) = 2g(x) - 5 = 2x^2 - 6x + \cancel{16-5} = 2x^2 - 6x + 11$ ۲

$g(f(x)) = (f(x))^2 - 3f(x) + 8 = (2x-5)^2 - 3(2x-5) + 8 = 4x^2 - 20x + 25 - 6x + 15 + 8$

$g(f(x)) = 4x^2 - 26x + 48$ | $f(g(x)) = g(f(x)) \Rightarrow 2x^2 - 6x + 11 = 4x^2 - 26x + 48$

$2x^2 - 20x + 37 = 0 \qquad \alpha^2 + \beta^2 = (\alpha+\beta)^2 - 2\alpha\beta$

$\alpha + \beta = 10$ $\qquad (\alpha+\beta)^2 - 2\alpha\cdot\beta = 100 - 37 = \boxed{63}$ جواب

$\alpha \cdot \beta = \frac{37}{2}$

$g(f(x)) = 5x^2 + 11 \qquad f(x) = 2x \qquad \min g(x-7)$

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

$\min g(x) = \min g(x-7) = 11$

$f(x) = 3x - 4$ $\qquad f(g(x)) = 3x^2 - 6x - 1 \Rightarrow f(g(x)) = 3g(x) - 4$

$g(f(x)) = ?$ $\qquad \Rightarrow 3g(x) - 4 = 3x^2 - 6x - 1 \Rightarrow g(x) = x^2 - 2x + 1$

$\Rightarrow g(x) = (x-1)^2 \Rightarrow g(f(x)) = (f(x) - 1)^2 = (3x-5)^2$ ۴

$\Rightarrow g(f(x)) = 9x^2 - 30x + 25$

$f(x) - g(x) = -x + 5 \Rightarrow$ (شکل ...) $\xrightarrow{\times 2}$ $2f(x) - 2g(x) = -2x + 10$

$-3f(x) + 2g(x) = -14$ $\qquad -3f(x) + 2g(x) = -14$

$+f(x) = +2x + 4 \Rightarrow g(x) = 3x - 1$ ۵

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

$f(x)=9^x$ $\quad f(g(x)) \le g(f(x)) \Rightarrow x^2 \le 2x \Rightarrow x^2-2x \le 0$

$g(x)=\log_3 x$ $\quad x(x-2) \le 0$ $\quad$ $\begin{array}{c|c|c} & 0 \quad 2 & \\ + & - & + \end{array}$ $\quad (0,2]$ ۶

$f(g(x)) = 9^{\log_3 x} \Rightarrow x^2 = \boxed{f(g(x)) = x^2} \to x>0$

$g(f(x)) = \log_3 f(x) \Rightarrow \log_3 9^x \Rightarrow 2x \Rightarrow g(f(x)) = 2x \quad x \in R$

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

$x-\frac{2}{x} = A \Rightarrow A^2 = x^2+\frac{4}{x^2}-4$ ۷

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

$A = D_{f(g(x))}$ $\quad A \cap B = ?$ $\quad \Rightarrow A=(0,8)$

$\Rightarrow B=(-\infty,4] \Rightarrow A\cap B=(0,4]$

$B = R_{f(g(x))} \Rightarrow R$ $\quad \underbrace{g(x) = 8x-x^2}_{(-\infty,16]}$ $\quad \underbrace{f(x)=\log_2 x}_{(-\infty,4]}$ ۸

$D_f = x>0$ $\quad D_{f(g(x))} = \{x \in D_g \mid R_g \in D_f\} \Rightarrow 8x-x^2>0 \Rightarrow x^2-8x<0$

$D_g = R$ $\quad$ $\begin{array}{c|c|c} & 0 \quad 8 & \\ + & - & + \end{array}$

$D_{f(g(x))} = (0,8)$

$f(h(x)) = -3f^2_{(x)}+1$

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

$g(x) = x-1$

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

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

$x^3-3x^2+3x-\cancel{1}+2x=\cancel{2+1}$ ۹

$= x^3-\cancel{3x^2}+5x-2 = -\cancel{3x^2}+1$

$x^3+5x-3=0 \longrightarrow$ یک ریشه دارد

زیرا عبارت اکیداً صعودی است

x^3 اکیداً صعودی

$5x$ اکیداً صعودی $\Rightarrow$ x^3+5x اکیداً صعودی

$f(x) = x-\frac{4}{x}$ $\quad g(f(x)) = ax^3+2x$ $\quad g(3)=8$

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

$x=4 \Rightarrow 64a+8=8 \Rightarrow a=0$

$x=-1 \Rightarrow -a-2=8 \Rightarrow a=-10$