نام و نام خانوادگی ....امیرعلی ترابی راد.......... پاسخنامه تشریحی تکلیف شماره ..۱.... کلاس ...دوازدهم تجربی B..........

۱۱ آفرین ۱۹٫۵

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$D_{gof} = \{x \in D_f \,,\, f(x) \in D_g\}$

$D_f \Rightarrow x-1>0 \Rightarrow x>1$

$\log_2^{x-1} \geq 0 \Rightarrow x-1 \geq 1 \Rightarrow x \geq 2$ $\overset{\cap}{\Rightarrow} D_f = [2, +\infty)$

$D_g \Rightarrow -x^2+4x-4 \geq 0 \Rightarrow x^2-4x+4 \leq 0 \Rightarrow (x-2)^2 \leq 0 \Rightarrow x=2 \Rightarrow D_g=\{2\} \Rightarrow f(x)=2 \Rightarrow \log_2^{x-1}=4$

$\Rightarrow x-1=16 \Rightarrow x=17 \Rightarrow D_{gof}=\{17\}$

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

$gof(x)=g(2x-5)=(2x-5)^2-3(2x-5)+8=4x^2-20x+25-6x+15+8=4x^2-26x+48$

$fog(x)=gof(x) \Rightarrow 2x^2-6x+11=4x^2-26x+48 \Rightarrow 2x^2-20x+37=0$ $\quad S=\frac{-(-20)}{2}=10 \quad P=\frac{37}{2}$

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

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$gof(x)=g(f(x))=g(2x)=5x^2+11$

$2x=t \Rightarrow x=\frac{t}{2}$

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

$g(x-7)=\frac{5(x-7)^2}{4}+11=\frac{5}{4}(x-7)^2+11$ $\quad x_s=7$, $\boxed{y_s=11} \Rightarrow \min$

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

$\Rightarrow g(x)=(x-1)^2$

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

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$2f(x)-2g(x)=-2x+10$

$3f(x)-2g(x)=14$

$\Rightarrow f(x)=2x+4$ $\quad f(x)-g(x)=-x+5 \Rightarrow 2x+4-g(x)=-x+5$

$\Rightarrow g(x)=3x-1$

$f(g(a))=0 \overset{g(a)=t}{\Rightarrow} f(t)=0 \Rightarrow f(t)=2t+4=0 \Rightarrow t=-2$

$\Rightarrow g(a)=-2 \Rightarrow 3a-1=-2 \Rightarrow 3a=-1 \Rightarrow a=\frac{-1}{3}$

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$$fog = f(\log_3 x) = 9^{\log_3 x} = x^2$$

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

$$\begin{array}{c|c|c} + & - & + \end{array} \quad (0,\ 2) \quad x \in [0, 2] \implies 1, 2 \implies ۲\text{تا}$$

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

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

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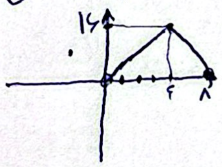
$$D_{fog} = \{x \in \underbrace{D_g}_{R} \mid g(x) \in D_f\}$$

$$D_f \implies x > 0 \quad 8x - x^2 > 0 \implies x(8-x) > 0 \quad \begin{array}{c|c|c} - & + & - \end{array} \ (0,\ 8)$$

$$D_{fog} = (0, 8) = A \qquad fog(x) = f(8x - x^2) = \log_2^{8x - x^2} = R_{fog}$$



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

$$8x - x^2 = 2^{R_{fog}}$$

$$A \cap B = \{4, 3, 2, 1\} \implies ۴ \text{ عضو}$$

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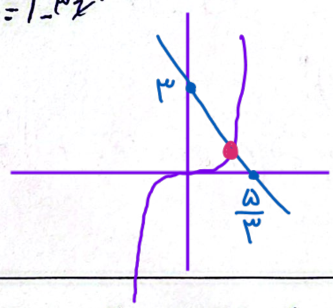
$$h(x-1) = (x-1)^3 + 2(x-1) + 1 = x^3 - 3x^2 + 3x - 1 + 2x - 2 + 1 = x^3 - 3x^2 + 5x - 2$$

$$f(f(x)) = 1 - 3f^2(x) \implies f(t) = 1 - 3t^2 \implies f(x) = 1 - 3x^2$$

$$x^3 - \cancel{3x^2} + 5x - 2 = 1 - \cancel{3x^2} \to x^3 + 5x - 3 = 0$$

$$x^3 = -5x + 3$$

یک برخورد دارند ⟵ یک ریشه



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$$g(f(x)) = ax^3 + 2x$$

$$g(3) = 8$$

$$\implies f(x) = 3 = x - \frac{4}{x} = 3 \implies x^2 - 4 = 3x \to x^2 - 3x - 4 = 0$$

$$(x-4)(x+1) = 0 \begin{cases} x = 4 \implies g(f(4)) = g(3) = 64a + 8 = 8 \to a = 0 \\ x = -1 \implies g(f(-1)) = g(3) = -a - 2 = 8 \to a = -10 \end{cases}$$

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