۲۰ آفرین ۱۱

شماره تکلیف 1

Date .... Subject .... رادمهر معتمدی

۱) $g(x)=\sqrt{-(x-2)^2} \to D_g=\{2\}$, $f(x)=\sqrt{\log_2^{x-1}} \geq 0$, $x>1$, $\to x-1\geq 1 \to x\geq 2$

$D_{gof}: f(x)\in D_g \wedge x\in D_f \to \sqrt{\log_2^{x-1}}=2 \to x=17$

$D_{gof}=\{17\}$

۲

۲) $fog(x)=gof(x) \to 2(x^2-3x+8)-5=(2x-5)^2-3(2x-5)+8$

$2x^2-6x+11=4x^2-20x+25-6x+15+8=4x^2-26x+48$

$\to 2x^2-20x+37=0 \to P=10,\ S=\frac{37}{2} \to \alpha^2+\beta^2=P^2-2S=63$

۲

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

$g(x-7)=\frac{5}{4}(x-7)^2+11 \to$ رأس $\begin{vmatrix}7\\11\end{vmatrix} \to min=11$

۲

۴) $fog(x)=3g(x)-4=3x^2-6x-1 \to g(x)=x^2-2x+1=(x-1)^2$

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

۲

۵) $(f-g)(x)=5-x$: $\left.\begin{matrix}f-g=5-x\\2g=3f-14\end{matrix}\right\}$ $\left.\begin{matrix}2f-2g=10-2x\\2g=3f-14\end{matrix}\right\}$ $2f=3f-2x+10-14$

$2g=3f-14$

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

$fog(a)=6a+2=0 \to a=-\frac{1}{3}$

۲

PARDIS

Subject Date

۱۶)

$$f\circ g(x) = 9^{\log_3 x} \underset{x>0}{=} x^2$$

$$g\circ f(x) = \log_3 9^x = 2x$$

$$f\circ g(x) \le g\circ f(x) \to x^2 \le 2x \to x(x-2) \le 0 \quad \begin{array}{ccccc} & 0 & & 2 & \\ + & | & - & | & + \end{array}$$

$$\to \underset{x>0}{x \in [0,2]} \to x = 1,2$$

۲

۱۷)

$$f\left(x - \frac{2}{x}\right) = x^2 + x - 4 - \frac{2}{x} + \frac{4}{x^2} = \frac{x^4 + x^3 - 4x^2 - 2x + 4}{x^2}$$

$$= \frac{x^4 - 4x^2 + 4}{x^2} + \frac{x^3 - 2x}{x^2} = \left(\frac{x^2-2}{x}\right)^2 + \frac{x^2-2}{x} \xrightarrow[\frac{x^2-2}{x}=t]{} f(t) = t^2 + t$$

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

۲

۱۸)

$$A = D_{f\circ g}, \quad B = R_{f\circ g}$$

$$f\circ g = \log_2((8-x)x) \to A: (8-x)x > 0 \quad \begin{array}{ccccc} & 0 & & 8 & \\ - & | & + & | & - \end{array} \to A = (0,8)$$

$$8x - x^2 = x(8-x) \to \max \to 16 \to \log_2 16 = 4 \to B = (-\infty, 4]$$

$$A \cap B = (0,4] \to 1,2,3,4$$

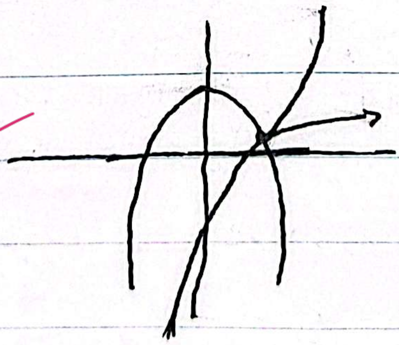
۴

۱۹)

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

$$h(x-1) = f(x)$$

آلیه صمدی



۱ ریشه دارد

۲

۱۰)

$$f(x) = x - \frac{4}{x} \to f(x) = 3 \to x - \frac{4}{x} = 3 \to x^2 - 3x - 4 = (x+1)(x-4) = 0$$

$$x_1 = -1 \to g(3) = -a - 2 = 8 \to a = -10$$

$$x_2 = 4 \to g(3) = 64a + 8 = 8 \to a = 0$$

۲