پارسا شیرازی

1) $g(f(x))$ $\Rightarrow x \in D_f ,\ f(x) \in D_g \Rightarrow x-1>0 \to x>1$ (1)

$\log_2^{x-1} \geq 0 \to x-1 \geq 1 \to x \geq 2 \Rightarrow [2,+\infty)$ (1)

$\sqrt{-(x^2-6x+5)} \Rightarrow$ نقطه (2) $\to f(x) \in \{4\} \to \log_2^{x-1} = 4 ,\ x-1 = 16 \to x = 17$ (2) $\to$ (1) $\cap$ (2) $= \{17\}$

2) $2(x^2-3x+8)-5 = (2x-5)^2 - 3(2x-5)+8 \Rightarrow 2x^2-6x+16-5 = 4x^2+25-20x-6x+15+8$

$\to 2x^2 - 20x + 37 = 0$

$\alpha^2+\beta^2 = (\alpha+\beta)^2 - 2\alpha\beta \to \frac{20}{2} = 10 \to 100 - 2\left(\frac{37}{2}\right) = 100-37 = 63$

3) $g(f(x)) = 5x^2+11 \Rightarrow g(2x) = 5x^2+11 \Rightarrow g(x) = 5\left(\frac{x}{2}\right)^2+11 \Rightarrow \frac{5}{4}x^2+11 \to g(x-7) =$

$5\left(\frac{x-7}{2}\right)^2+11 \to 5\left(\frac{x^2+49-14x}{4}\right)+11$

$\to \min \to$ توان (2) صفر باشد $\Rightarrow 11 \to 5(0)+11 = 11$

4) $f(g(x)) \to 3g-4 = 3x^2-9x-1 \to 3g = 3x^2-9x+3 \to g = x^2-3x+1 \to g(f(x)) = (3x-5)^2 - 3(3x-5)+1$

$(x-1)^2$

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

5)

$f-g = -x+5$

$g(x) = \frac{3}{2}f(x) - 7 \Rightarrow -\frac{1}{2}f(x) + 7 = -x+5$

$f(g(x)) = \frac{-2}{a}x + 2$

$g(x) = 3x-1$

$-x-2 \to f(x) = 2x+4$

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

6) $g(f(x)) \Rightarrow \log_3^{9^x} \to 2x \geq x^2 \Rightarrow x^2-2x \leq 0 \to x(x-2) \leq 0 \to$ (+ − +) $\to 0, 1, 2 \to 1, 2$

$f(g(x)) \Rightarrow 9^{\log_3^x} \to x^2$

$x>0$ دامنه

(2) عدد صحیح

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

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

8) $f(g(x)) \Rightarrow \log_2^{8x-x^2} \to 8x-x^2 > 0$

$x^2-8x<0 \to$ (+ − +) $\Rightarrow x \in (0,8)$ (1)

$D_f \to \log_2^{8x-x^2} \to -x^2+8x \to -\frac{b}{2a} \Rightarrow \frac{-8}{-2} = 4 \to -16+32 = 16 \to \cap \to (-\infty,16]$

$\to \log_2^{(0,16]} \Rightarrow (-\infty, 4]$ (2) $\to$ (1) $\cap$ (2) $\Rightarrow (0,4]$

$1, 2, 3, 4 \to$ ۴ عضو

۹)

~~$h(x) =$~~ $f(f(x)) = 1 - 3f^2(x)) \rightarrow f(x) = 1 - 3x^2$

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

$x^3 - 1 + 3x - 3x^2 + 2x - 1$

$x^3 - 3x^2 + 5x - 2 = 1 - 3x^2 \rightarrow x^3 + 5x - 3 = 0 \rightarrow x^3 + 5x = 3$

← دو تابع صعودی (ولی یک ...)

یک نقطه برخورد

یک جواب

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۱۰)

$g(f(x)) = ax^3 + 2x \Rightarrow g(3) = 8 \rightarrow a \times 64 + 8$

$f(x) = 3 \rightarrow x - \frac{4}{x} = 3 \rightarrow x = 4$ $\qquad a = 0$

↳ یا $x = -1 \Rightarrow -a - 2 = 8 \rightarrow -a = 10 \rightarrow a = -10$