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ملینا اسحار

$D_f: \log_2^{x-1} \geq 0 \Rightarrow x-1 \geq 1 \Rightarrow \boxed{x \geq 2}$ ۱

$g(x) = \sqrt{-(x^2-4x+4)} = \sqrt{-(x-2)^2}$ $x=2$ ۱/۵

$D_g: \{2\}$

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

دقت کن!! $x \in [2,+\infty)$ I $\sqrt{\log_2^{x-1}} \in \{2\}$

$x-1 = 4 \Rightarrow x = 5$ II

$D_{gof}: I \cap II: \{\cancel{5}\}$ ۱۷ $\sqrt{\log_2^{x-1}} = 2 \to \log_2^{x-1} = 4$ $x-1=16$ $x=17$

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

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

$\Rightarrow 2x^2-6x+11 = \underbrace{4x^2-20x+25-6x+15+8}_{4x^2-26x+48}$

$\Rightarrow 0 = 2x^2-20x+37 \longrightarrow x = \frac{-b\pm\sqrt{b^2-4ac}}{2a}$

$= \frac{20\pm\sqrt{400-4(2)(37)}}{4} = \frac{20\pm\sqrt{400-296}}{4} = \frac{20\pm\sqrt{104}}{4}$

$= \frac{20\pm\sqrt{4\times 26}}{4} = 5 \pm \frac{\sqrt{26}}{2}$

$(5+\frac{\sqrt{26}}{2})^2 + (5-\frac{\sqrt{26}}{2})^2 = 25+\frac{26}{4}+5\sqrt{26}+25+\frac{26}{4}-5\sqrt{26}$

$= 100 + \frac{52}{4} = 100+13 = 113$

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

$gof(x) = (2x-5)^2-3(2x-5)+8 = 4x^2-26x+48$ $\} = \to 2x^2-20x+37$

$S^2-2P = (\frac{20}{2})^2-2(\frac{37}{2}) = 63$

$f(\log_3^x) \leq g(9^x) \Rightarrow 9^{\log_3^x} \leq \log_3^{9^x}$ ۶

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$3^{2,100} \leq x \log_3^{3^2} \Rightarrow \leq 2x$

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

$gof(x) = \log_3^{9^x} = 2x \rightarrow x^2 \leq 2x \rightarrow 0 \leq x \leq 2$

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

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

$f(t) = t^2 + t \Rightarrow f(x) = x^2 + x$

۸ - $D_{fog} = \{x \in D_g , g(x) \in D_f\}$

0

$D_f = x > 0 , 8x - x^2 > 0 \rightarrow 0 < x < 8$ (A)

(B)

$R_g = (-\infty , 16] \rightarrow \log_2^x \rightarrow (-\infty , 4] \rightarrow R_{fog} = (-\infty , 4]$

$A \cap B = (0 , 4]$