تمرینا صفحه:

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(۱)

$\sqrt{-x^2+4x-4}$

$\sqrt{-(x-2)^2}$

$x=2$

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

$\log_2^{(x-1)} \geq 0$

$x-1 \geq 1$

$x \geq 2$

$D_f(x)=\{17\}$

$D_g(x)=2 \rightarrow f(x)=2$

$\sqrt{\log_2^{x-1}}=2 \longrightarrow \log_2^{x-1}=4 \longrightarrow 16=x-1 \Rightarrow x=17$

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(۲)

$f \circ g(x) = g \circ f(x)$

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

$g(2x-5) \Rightarrow 4x^2-26x+48$

$\longrightarrow 2x^2-6x+11 = 4x^2-26x+48 \longrightarrow 2x^2-20x+37=0$

$\longrightarrow S^2-2P = 100-37 = 63$

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(۳)

$f(x)=2x$

$2x=t$

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

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

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

$\frac{5}{4}(x-7)^2-11 \longrightarrow \min x=7$

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(۴)

$f(x)=3x-4$

$f \circ g(x)=3x^2-6x-1$

$x \xrightarrow{g} \cdots\cdots \xrightarrow{3x-4} 3x^2-6x-1$

$3x^2-6x+1+4 = 3x^2-6x+3 \; \div 3 \Rightarrow x^2-2x+1$

$g \circ f = g(3x-4) \Rightarrow (3x-4)^2-2(3x-4)+1 = 9x^2-30x+25$

(۵) $2g(x) = 3f(x) - 14 \Rightarrow g(x) = \frac{3}{2} f(x) - 7$

$g(x) = 3x - 1$; $6x - 2$; $6x + 12 - 14$

$-x + 5 \Rightarrow f - g(x)$

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

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

$-\frac{1}{2} f(x) = -x - 2 \Rightarrow f(x) = 2x + 4$

$f \circ g \Rightarrow 6x - 2 + 4 \Rightarrow 6x + 2$

$6x + 2 = 0 \quad 6x = -2 \Rightarrow x = \frac{-2}{6} = \frac{-1}{3}$

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(۶) $f(x) = 9^x$, $g(x) = \log_3 x$

$f \circ g = 9^{\log_3 x} = x^2$

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

$x^2 \leq 2x \longrightarrow x^2 - 2x \leq 0$

$x \in [0, 2]$ $0, 1, 2$

۳ عدد

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

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

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(۸) $f(x) = \log_2 x$, $g(x) = 8x - x^2$

$f \circ g = \log_2 (8x - x^2)$

$8x - x^2 > 0$: 0, 8 ; $- \mid + \mid -$; $\frac{-b}{2a} = 4$

$x = 8 \to 4$; $x = 4 \to 4$

$(-\infty, 4]$, $(0, 8) \rightarrow 1, 2, 3, 4$

۴ عدد

تمرین تمام.

(۹)

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

$g(x) = x - 1$

$h(x) = x^4 + 2x + 1$

$h(x-1) = (x-1)^4 + 2(x-1) + 1 = x^4 - 2x^2 + 5x - 2 = 1 - 4x^2$

$x^4 + 5x - 4 = 0 \Rightarrow$ ۱ جواب

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(۱۰)

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

$x - \frac{4}{x} = 3 \Rightarrow x = 4$ $\qquad g(3) = 64a + 8 \Rightarrow a = 0$

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