

$g(x) = \sqrt{-(x-2)^2} \Rightarrow D_g = \{2\}$ $D_f: x-1 > 0 \Rightarrow x > 1$ $\log_2(x-1) > 0 \Rightarrow x-1 \geq 1 \Rightarrow x \geq 2$ $D_{g \circ f} = \{x \in D_f; f(x) \in D_g\} = \{x \geq 2 \mid f(x)=2 \Rightarrow \log_2(x-1)=2 \Rightarrow x=17\} \cap D_{g \circ f} = \{17\}$	۱
$2(x^2 - 4x + 1) - 5 = (2x - 5)^2 - 3(2x - 5) + 11$ $2x^2 - 4x + 11 = 4x^2 - 10x + 15 - 6x + 15 + 11$ $2x^2 - 10x + 19 = 0$ $\Delta = 100 - 152 = -52$ $S = \frac{-b}{a} = 1$ $P = \frac{c}{a} = \frac{19}{2}$	۲
$g(f(x)) = 2x^2 + 11$ $g(x) = \frac{5}{x} x^2 + 11$ $g(2) = 2x^2 + 11$ $g(x-1) = \frac{5}{x} (x-1)^2 + 11$ $2x = t \Rightarrow x = \frac{t}{2}$ $g(t) = \frac{5}{\frac{t}{2}} t^2 + 11$ $g(x-1) = \frac{5}{x} (x-1)^2 + 11$ $\min = 11$	۳
$f(g(x)) = 19g(x) - 1 = 19x^2 - 4x - 1 \Rightarrow 19g(x) = 19x^2 - 4x + 1$ $g(x) = x^2 - 2x + 1 = (x-1)^2$ $g \circ f(x) = (19x^2 - 4x - 1)^2 = (19x^2 - 4x - 1)^2$	۴
$f \circ g$ و $f - g$ تابع خطی است، g تابع خطی است $\begin{cases} f(0) - g(0) = 5 \\ 19f(0) - 19 = 19g(0) \end{cases} \Rightarrow \begin{cases} f(0) = 14, g(0) = -1 \\ 19f(0) - 19 = 19g(0) \end{cases}$ $\begin{cases} f(5) = g(5) \\ 19f(5) - 19 = 19g(5) \end{cases} \Rightarrow \begin{cases} f(5) = g(5) = 14 \\ 19f(5) - 19 = 19g(5) \end{cases}$ $m_f = \frac{14 - 14}{5 - 0} = 0 \Rightarrow f(x) = 14x + 14$ $m_g = \frac{14 - (-1)}{5 - 0} = 3 \Rightarrow g(x) = 3x - 1$ $f \circ g(x) = 4x + 2 \Rightarrow 4a + 2 = 0 \Rightarrow a = -\frac{1}{2}$	۵

$$\left. \begin{aligned} f \circ g &= q^{\log x} = x^r & D_{f \circ g} &= x \in (0, +\infty) \\ g \circ f &= \log q^x = x \log q = rx & D_{g \circ f} &= \mathbb{R} \\ x^r &\leq rx \Rightarrow x^r - rx \leq 0 \Rightarrow 0 \leq x \leq r \end{aligned} \right\} \cap \cdot \leq x \leq r$$

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$$f\left(x - \frac{r}{x}\right) = x^r - r + \frac{r}{x^r} + x - \frac{r}{x} = \left(x - \frac{r}{x}\right)^r + x - \frac{r}{x}$$

$$f(t) = t^r + t \quad f(x) = x^r + x$$

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$$D_{f \circ g}: D_g = \mathbb{R} \Rightarrow \wedge x - x^r > 0 \Rightarrow 0 < x < 1$$

$$D_f = (0, +\infty)$$

$$\max_{g(x)} = \frac{r}{14} \Rightarrow R_{f \circ g} = (-\infty, f(14)] = (-\infty, r]$$

$$A \cap B = (0, 1) \cap (-\infty, r] = (0, r] \quad \{1, 2, 3, 4\}$$

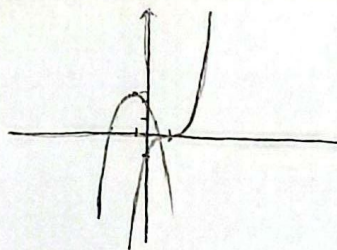
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$$f\left(\frac{f(x)}{t}\right) = 1 - \frac{f^r(x)}{t^r}$$

$$f(x) = 1 - x^r$$

$$(x-1)^r + r(x-1) + 1 = 1 - x^r$$

$$(x-1)^r = -x^r - rx + r$$



بل جواب دارد

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$$f(x) = x^r$$

$$x - \frac{r}{x} = r \begin{cases} \rightarrow r-1 = r \Rightarrow x = 1 \\ \rightarrow -1+r = r \Rightarrow x = -1 \end{cases}$$

$$g \circ f(r) = g \circ f(-1) = 1$$

$$4ra + 1 = -a - r = 1 \Rightarrow \text{مقداری برای } a \text{ وجود ندارد}$$

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