

f, f, v, v

مطابق سری

No
Date

الف

$$D_{g \circ f} = \{x \mid x \in D_f, f(x) \in D_g\} \quad D_f: \log_r(x-1) \geq 0 \rightarrow x-1 \geq 1 \rightarrow x \geq 2 \quad \text{I}$$

$$\text{III } x \in [r, +\infty), \sqrt{\log_r(x-1)} = r \rightarrow \log_r(x-1) = r^2 \rightarrow x-1 = r^{r^2} \rightarrow x = r^{r^2} + 1 \quad \text{II, I حاصل است}$$

$$\text{IV } D_g: \sqrt{-(x-r)^2} \geq 0 \rightarrow (x-r)^2 \leq 0 \rightarrow x = r$$

$$\text{III} \cap \text{IV} = [r, +\infty) \cap \{r\} = \{r\} = D_{g \circ f}$$

$$g \circ f(x) = (rx - a)^r - r(rx - a) + 1 = rx^r - r^2x + 1$$

$$f \circ g(x) = r(x^r - rx + 1) - a = rx^r - rx + 1 - a$$

$$g \circ f(x) = f \circ g(x) \Rightarrow rx^r - r^2x + 1 = rx^r - rx + 1 - a \Rightarrow rx^r - r^2x + 1 = rx^r - rx + 1 - a$$

$$x^r + \beta^r = \gamma^r - \gamma p \quad \begin{matrix} \gamma = \frac{-b}{a} \\ p = \frac{c}{a} \end{matrix} \Rightarrow 1 - r^2 = -r \Rightarrow r = 1$$

$$g \circ f(x) = g(rx) = ax^r + 1 \quad rx = t \rightarrow g(t) = \frac{at^r}{r} + 1$$

$$\Rightarrow g(x) = \frac{ax^r}{r} + 1 \Rightarrow g(x-v)^r = \frac{a}{r} x(x-v)^r + 1 = \frac{a}{r} x^r - \frac{rv}{r} x + \frac{r^2v}{r}$$

$$x_s = -\frac{b}{ra} = -\frac{-\frac{rv}{r}}{\frac{1}{r}} = v \xrightarrow{\text{مینه}} y_s = \min = g(0) = 1$$

$$f \circ g(x) = rx^r - rx + 1, f(x) = rx - f \Rightarrow f \circ g = rg - f$$

$$rx^r - rx + 1 = rg - f \Rightarrow g(x) = x^r - rx + 1 = (x-1)^r$$

$$\Rightarrow g \circ f(x) = (rx - f - 1)^r = (rx - a)^r$$

$$f \circ g(x) = \frac{r}{a}x + r, f - g(x) = -x + a, g(x) = \frac{r}{r}f(x) - v - a$$

$$f - g(x) = f(x) - \frac{r}{r}f(x) + v = -x + a \Rightarrow -\frac{1}{r}f(x) = -x + r$$

$$\Rightarrow f(x) = rx + r, g(x) = \frac{r}{r}(rx + r) - v = rx - 1$$

$$f(g(x)) = r(rx - 1) + r = 4x + r = \frac{r}{a}x + r \Rightarrow 4 = \frac{r}{a} \Rightarrow a = \frac{1}{r}$$

$$f \circ g(x) = g \circ f(x) = x^r \Rightarrow x^r \leq rx$$

$$g \circ f(x) = \log_r f(x) = \log_r g(x) = x \log_r g(x) = rx \Rightarrow x^r - rx \leq 0 \Rightarrow x \in [0, r]$$

$$Z: 0, 1, 2 \Rightarrow 1, r$$

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

$$\Rightarrow f(x) = x^r - x$$

$$D_{f \circ g} = \left\{ x \mid x \in Dg, g(x) \in D_f \right\}, \quad \begin{matrix} D_f: x > 0 \\ D_g: \mathbb{R} \end{matrix} \quad \text{--- A}$$

$$\mathbb{R} \cap \{x \mid x > 0\} = \mathbb{R}^+$$

$$D_{f \circ g} = (0, \infty) = A$$

$$R_{f \circ g}: x \rightarrow [g] \rightarrow g(x) \rightarrow [f] \rightarrow f(g(x)) \xrightarrow{f \circ g = g \circ f} \mathbb{R} \rightarrow [g] \rightarrow (-\infty, 19] \rightarrow [f] \rightarrow (-\infty, f] \quad \text{--- B}$$

$0 < x \leq 14$
 $\log x \leq f$

$$A \cap B = (0, \infty) \cap (-\infty, f] = (0, f]$$

$$f(f(x)) = 1 - 3f'(x) \Rightarrow f(t) = 1 - 3t' \Rightarrow f(x) = 1 - 3x' \quad \text{--- 9}$$

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

$$\Rightarrow h \circ g(x) = f(x) \Rightarrow x^3 - 3x^2 + 2x - 2 = 1 - 3x' \Rightarrow x^3 + 2x - 3 = 0$$

$$f'(x) = 3x^2 + 2 \Rightarrow \dots$$

$$g(f(x)) = ax^3 + 2x, \quad g(3) = 1 \Rightarrow f(x) = 3 = x - \frac{4}{x} \quad \text{--- 10}$$

$$\Rightarrow x - \frac{4}{x} = 3 \Rightarrow x^2 - 3x - 4 = 0 \quad \begin{cases} x_1 = -1 \\ x_2 = 4 \end{cases}$$

$$\left\{ \begin{array}{l} x = -1 \rightarrow -a - 2 = 1 \Rightarrow a = -3 \\ x = 4 \rightarrow 4a + 1 = 1 \Rightarrow a = 0 \end{array} \right.$$

$$g(f(x)) \quad \left\{ \begin{array}{l} x = -1 \rightarrow -a - 2 = 1 \Rightarrow a = -3 \\ x = 4 \rightarrow 4a + 1 = 1 \Rightarrow a = 0 \end{array} \right.$$

$$f(x) = 3$$

$$g(3) = 1$$