

(تأليف حورا حقيقي)

20

$$D_{g \circ f}(x) = \{x \mid x \in D_f \cap f(x) \in D_g\} \quad (1)$$

$$D_{of} = \left\{ \begin{array}{l} (1) x-1 > 0, x > 1 \\ (2) \log_{\frac{x-1}{2}} > 0, x-1 > 1, x > 2 \end{array} \right\} \quad (1) \cap (2) = [2, +\infty)$$

$$(2) D_g = \sqrt{-(x-2)^2} > 0 \rightarrow x=2 \rightarrow \sqrt{\log_{\frac{x-1}{2}}} = 2 \rightarrow \log_{\frac{x-1}{2}} = 4$$

$$x-1 = 14$$

$$\underline{x = 15}$$

$$D_{g \circ f} = (1) \cap (2) = \{15\} \checkmark$$

(2)

$$f \circ g(x) = g \circ f(x) \quad (1)$$

$$f(x^2 - 3x + 1) - \omega = (5x - \omega)^2 - 3(5x - \omega) + 1$$

$$5x^2 - 4x + 14 - \omega = 5x^2 + 2\omega - 20x - 4x + 1\omega + 1$$

$$5x^2 - 10x + 2\omega = 0 \quad \alpha^2 + \beta^2 = 5^2 - 2\omega = 100 - 2 \times \frac{31}{2} = 44 \checkmark$$

(2)

$$g \circ f = \omega x^2 + 11 \quad (1)$$

$$f(x) = (5x - \omega) \rightarrow \frac{\omega}{5} x^2 + 11 \Rightarrow g(x) = \frac{\omega}{5} x^2 + 11$$

(2)

$$g(x-1) = \frac{\omega}{5} (x-1)^2 + 11 \Rightarrow \min = 11 \checkmark$$

(1)

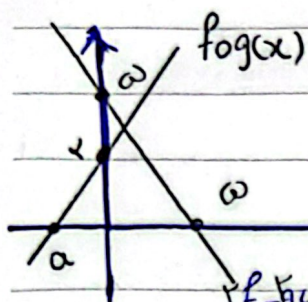
$$f(x) = 5x - 1 \quad f(g(x)) = 5 = 5x^2 - 4x - 1$$

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

$$g \circ f(x) = (5x - \omega)^2 - 4x - 1\omega \quad g(x) = x^2 - 2x + 1 = (x-1)^2$$

(2)

● dotnote



(a)

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

$$r(x=0) \Rightarrow y = r$$

$$\Rightarrow y = 0 \cdot x = r(r(x-1)) = -r$$

$$r(f-g(x)) = -x + \omega x r$$

$$r(g(x)) = r(f(x)) = -r$$

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

$$f(x) = x + r$$

$$g(x) = x - 1$$

$$r(x+r) - g = -x + \omega$$

$$r(x-1)$$

(y)

$$x = -\frac{1}{r} = a$$

$$f(x) = q^x$$

$$g(x) = \log_q(x) > 0$$

$$f \circ g(x) = q^{\log_q(x)} = x$$

$$g \circ f(x) = \log_q(q^x) = x$$

$$x^r < r x$$

$$x^r - r x < 0 \quad x(x-r) < 0$$

$$\textcircled{1} \cap \textcircled{2} \quad 0 < x < r \Rightarrow \{1, r\}$$

(y)

$$\textcircled{2} \quad \frac{0}{+} \frac{r}{-} \frac{r}{+}$$

(v)

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

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

(y)

(A)

$$D_{f \circ g}(x) = \{x \mid x \in D_g \cap g(x) \in D_f\}$$

$$x(1-x) > 0$$

$$\frac{0}{-} \frac{1}{+} \frac{1}{-}$$

$$0 < x < 1 \Rightarrow D_{f \circ g} = A$$

$$\log_q \frac{1-x}{x} = \frac{1}{r} = \frac{1}{r} = r \quad r(r-1) = 14$$

$$(-\infty, r] = B$$

$$A \cap B = (0, r] \Rightarrow \{1, r, r^2, r^3\}$$

(y)

dn

$$f \circ f(x) = 1 - x^r f'(x)$$

(9)

$$g(x) = x - 1$$

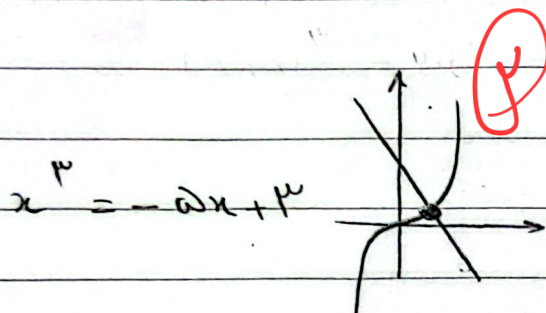
$$h(x) = x^r + rx + 1$$

$$f(\underbrace{f(x)}) = 1 - \underbrace{r f'(x)}_{+r} \quad f(x) = 1 - x^r$$

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

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

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



$$-x^r = x^r - rx + 1 \Rightarrow x^r + rx - x^r = 0$$

بالجواب ✓

(10)

$$f(x) = x - \frac{r}{x}$$

$$g \circ f(x) = ax^r + rx$$

$$f(x) = x - \frac{r}{x} = 0$$

$$x^2 - rx - r = 0 \quad (x - \frac{r}{x})(x+1) = 0$$

$$g(r) = 1$$

$$g(f(x)) = ax^r + rx \rightarrow x = r \quad 4fa + 1 = 1$$

$$a = 0$$

$$\rightarrow x = -1$$

y

$$-a - r = 1$$

$$a = -10$$