

$$D_{g \circ f} = \{x \mid x \in D_f \text{ و } f(x) \in D_g\} \Rightarrow D_f \Rightarrow \begin{cases} \textcircled{1} x-1 > 0 \Rightarrow x > 1 \\ \textcircled{2} \log_2 x-1 \geq 0 \Rightarrow x-1 \geq 1 \end{cases}$$

$$D_f = \{x \geq 2\}$$

$$\Rightarrow D_g \Rightarrow -(\underbrace{x-2}_+)^2 \geq 0 \Rightarrow D_g = \{2\} \Rightarrow D_{g \circ f} \Rightarrow \sqrt{\log_2 x-1} = 2$$

$$\log_2 x-1 = 4 \Rightarrow x-1 = 14 \Rightarrow x = 15$$

$$f \circ g = g \circ f \Rightarrow 2(x^2 - 2x + 1) - 5 = 2(x-5)^2 - 2(2x-5) + 1$$

$$2x^2 - 4x + 1 = 2x^2 - 20x + 25 - 4x + 10 + 1 \Rightarrow 2x^2 - 24x + 36 = 0$$

$$\alpha^2 + \beta^2 = 5^2 - 2P = (2 \frac{P}{P})^2 - 2V = 100 - 2V = 64$$

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

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

$$g(x-1) = 5(x-1)^2 + 11 = 5x^2 - \frac{10}{2}x + \frac{21}{2} \Rightarrow \frac{1}{2}gs = \frac{-A}{2a}$$

$$= \frac{14 \cdot 5 - 12 \cdot 20}{0} = \frac{70}{0} = 11$$

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

$$\Rightarrow g(x) = 2x^2 - 2x + 1$$

$$9x^2 - 24x + 14 - 4x + 1 + 1 = 9x^2 - 28x + 16$$

$$\begin{aligned} f-g &= -(x+5) & 3f-2g &= 14 & \Rightarrow 3f-2g &= 14 \\ f-g &= -x+5 & -2f+2g &= 2x-1 & \Rightarrow f(x) &= 2x+4 \Rightarrow g(x) &= 2x-1 \end{aligned}$$

$$\Rightarrow f \circ g(x) = 2(2x-1) + 4 = 4x+2$$

$$\Rightarrow f \circ g(a) = 0 \Rightarrow 4a+2 = 0$$

$$\Rightarrow a = -\frac{1}{2}$$

$$f \circ g(x) = 9^{\log_9 x} = x^{\log_9 9} = x^1 = x \quad g \circ f(x) = \log_9 9^x = x \log_9 9 = 1x$$

$$x^1 \leq 1x \Rightarrow x^1 - 1x \leq 0 \Rightarrow \frac{x^1 - 1x}{x^1} = [0, 9] \Rightarrow \{1, 9\} \text{ عدد}$$

$$x^2 + x - 1 - \frac{1}{x} + \frac{1}{x^2} = x - \frac{1}{x} + x^2 + \frac{1}{x^2} - 1 = \frac{x^2 - 1}{x} + \frac{x^2 + 1}{x^2} - 1$$

$$\Rightarrow \frac{x^2 - 1}{x} = t \Rightarrow f\left(\frac{x^2 - 1}{x}\right) \Rightarrow f(t) = t^2 + t \Rightarrow \boxed{f(x) = x^2 + x}$$

$$Df \circ g = \{x \mid x \in Dg, g \in Df\} \Rightarrow Dg = Rg, Df \Rightarrow x > 0$$

$$\Rightarrow -x^2 + 1x > 0 \Rightarrow \frac{-x^2 + 1x}{-x^2} \Rightarrow (0, 1) \Rightarrow Df \circ g = (0, 1) = A$$

$$Rg = (-\infty, 14] \Rightarrow \log_9 g = \log_9 (-\infty, 14] = (0, 4] \Rightarrow Rf \circ g = (0, 4] = B$$

$$A \cap B = (0, 1) \cap (0, 4] = (0, 4] = \{1, 9, 27, 81\} \text{ كائنات}$$

$$f(f(x)) = 1 - 3f'(x) \Rightarrow f(t) = 1 - 3t^2 \Rightarrow f(x) = 1 - 3x^2$$

$$f(x) = t \quad h(g(x)) = (x-1)^2 + 2(x-1) + 1 = x^2 - 2x + 1 + 2x - 2 + 1 = x^2 - 2x + 1$$

$$x^2 - 2x + 1 = 1 - 3x^2 \Rightarrow x^2 + 2x - 1 = 0 \Rightarrow p(x) = x^2 + 2x - 1$$

$$p'(x) = 2x + 2 \Rightarrow \text{مقادير صفر} \Rightarrow x = -1 \text{ فقط يك ریشه}$$

$$g(3) = 1 \Rightarrow x - \frac{1}{x} = 3 \Rightarrow \frac{x^2 - 1}{x} = 3 \Rightarrow x^2 - 3x - 1 = 0 \Rightarrow (x-4)(x+1) = 0$$

$$x = 4 - 1 \Rightarrow \frac{1}{g(3)} \Rightarrow g(f(-1)) = -a + 2 = 1 \Rightarrow -a = 4$$

$$\boxed{a = -4}$$

$$g(3) \Rightarrow g(f(4)) = 4a + 19 = 1 \Rightarrow 4a = -18 \Rightarrow \boxed{a = -\frac{9}{2}}$$