

١٩, ٧٥ أفريت ١١

$$Dgof_{(n)} = Df \cap f(n) \in Dg$$

①

$$Df = n-1 > 0$$

$$n > 1$$

$$\log_r^{n-1} \gg 0$$

$$n-1 \gg 1$$

$$n \gg 2$$

$$n \gg 2$$

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$$Dg = -(n^2 - \varepsilon n + \varepsilon) \gg 0$$

$$Dg = \{2\}$$

$$-(n-2)^2 \gg 0$$

$$\sqrt{\log_r^{n-1}} = 2$$

$$\log_r^{n-1} = 4$$

$$n-1 = 14$$

$$n = 15$$

$$n \gg 2 \wedge n = 15 \quad Dgof = \{15\}$$

$$f(n^2 - 3n + 1) = g(2n - 5)$$

②

$$2(n^2 - 3n + 1) - 5 = (2n - 5)^2 - 2(2n - 5) + 1$$

$$2n^2 - 6n + 2 - 5 = 4n^2 - 20n + 25 - 4n + 10 + 1$$

$$0 = 2n^2 - 26n + 35$$

$$S^2 - 13P = 100 - 2\left(\frac{15}{2}\right) = 95$$

$$S = \frac{10}{2} = 5$$

$$P = \frac{35}{2}$$

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$$g(2n) = 5n^2 + 11$$

$$2n = t$$

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

③

$$g(n-5) = \frac{5}{4}(n-5)^2 + 11 = \frac{5}{4}n^2 - \frac{25}{2}n + \frac{125}{4} + 11$$

$$= \frac{5}{4}n^2 - \frac{25}{2}n + \frac{147}{4}$$

$$\frac{-b}{2a} = \frac{\frac{25}{2}}{\frac{5}{2}} = 5$$

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$$\xrightarrow{n=5} \frac{5 \times 25}{4} - \frac{25 \times 5}{2} + \frac{147}{4} = \frac{55}{4} = 13.75$$

(4)

$$f(g(n)) = 3g(n) - 4 = 3n^2 - 4n - 1$$

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

$$gof(n) = g(f(n)) = g(3n-4) = (3n-4-1)^2 = (3n-5)^2 = 9n^2 - 30n + 25$$

$$f-g(n) = -n+5$$

$$f(n) - g(n) = -n+5$$

$$g(n) = \frac{3f(n) - 14}{3}$$

$$f(n) - \left(\frac{3f(n) - 14}{3} \right) = -n+5$$

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(5)

$$\rightarrow 2f(n) - 3f(n) + 14 = -2n + 10$$

$$2n + 4 = f(n)$$

$$g(n) = \frac{3(2n+4) - 14}{3} = \frac{4n-2}{3} = 3n-1$$

$$f(g(n)) = \frac{1}{a}n + 2$$

$$f(g(n)) = f(3n-1) = 2(3n-1) + 4 = 4n + 2$$

$$\frac{1}{a}n + 2 = 4n + 2$$

$$\frac{1}{a} = 4$$

$$a = \frac{1}{4}$$

طبق بند ۸ سمت چپ محور و ها

است ← a < 0

$$-\frac{1}{a}n = 4n \rightarrow a < -\frac{1}{4}$$

$$f(g(n)) = 4^{\log_4 n} = n^4$$

$$g(f(n)) = \log_4 n = 2n$$

(6)

$$n^4 \leq 2n$$

$$n^4 - 2n \leq 0$$

$$\frac{n^4}{n^4 - 2n}$$

$$0 \leq n \leq 2$$

اولی و عضو

$$0 < n \leq 2$$

غیر قابل قبول $(\log_4 n)$

$$f\left(n - \frac{1}{n}\right) = n - \frac{1}{n} + \left(n^2 + \frac{1}{n^2} - 4\right) = n - \frac{1}{n} + \left(n - \frac{1}{n}\right)^2$$

(7)

$$f(n) = n + n^2$$

$$D_{f \circ g} = Dg \cap g^{-1}(Df)$$

①

$$\mathbb{R} \cap \{x \mid x - x^2 > 0\}$$

$$\frac{0}{-4+4} = \frac{1}{-4+4}$$

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

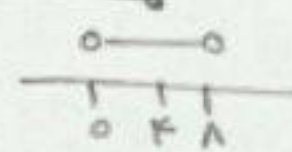
* $x - x^2$
 $= x(-x+1)$
 $\max = 22 - 14 = 14$



$$f \circ g(x) = \log_2 \frac{1-x-x^2}{2} \xrightarrow{*} \log_2 14 = F$$

②

$$R_{f \circ g} = (-\infty, F] = B \quad A \cap B = (0, F]$$



$$f(f(x)) = 1 - 3f'(x) \rightarrow f(x) = 1 - 3x^2$$

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

④

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

$$x^3 - 3x^2 + 3x - 1 + 2x - 2 + 1 = 1 - 3x^2$$

$$x^3 + 5x - 1 = 0$$

با استفاده از روش نیوتن جواب دارد ✓

②

$$g(f(x)) = g\left(x - \frac{1}{x}\right) = ax^3 + 2x$$

⑩

$$x - \frac{1}{x} = 3$$

$$x = -1$$

$$x = 4$$

$$g\left(-1 - \frac{1}{-1}\right) = -a - 2 = 1$$

$$-10 = a$$

②

$$g\left(4 - \frac{1}{4}\right) = 4fa + 1 = 1$$

$$a = 0$$