

کتابا اسیر کیا

خواندهم دفتر B

تالیفات سعاد

۲۰ آفرین

$$f(n) = \sqrt{\log \frac{n-1}{2}}$$

$$D_{g \circ f} = ?$$

①

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$$g(n) = \sqrt{-n^2 + \varepsilon n - \varepsilon} = \sqrt{-(n-2)^2}$$

$$D_{f \circ g} = \{n \in D_f, f(n) \in D_g\}$$

$$n-1 \geq 0 \rightarrow n \geq 1$$

$$\log \frac{n-1}{2} \geq 0 \rightarrow n-1 \geq 1 \rightarrow n \geq 2$$

$$-(n-2)^2 \geq 0 \rightarrow n=2 \sim D_g$$

$$\sqrt{\log \frac{n-1}{2}} = 2 \rightarrow \log \frac{n-1}{2} = 4 \rightarrow n-1 = 17 \rightarrow \boxed{n=18}$$

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

②

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

$$\rightarrow 2n^2 - 6n + 2 - 5 = 4n^2 - 12n + 10 - 6n + 5 + 1 \rightarrow 2n^2 - 12n + 16 = 0$$

$$a^2 + b^2 = 5^2 - 12 = 13 \quad \left(\frac{-b}{a}\right)^2 - 1\left(\frac{c}{a}\right) = 100 - 12 = 88$$

$$g \circ f(n) = an^k + 11 \quad f(n) = kn$$

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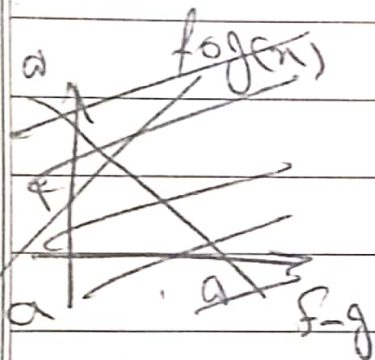
$$g(n-v) = ?$$

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$$g(kn) = an^k + 11 \rightarrow g(n) = a\left(\frac{n}{k}\right)^k + 11$$

$$g(n) = \frac{an^k}{\varepsilon} + 11 \quad g(n-v) = \frac{a(n-v)^k}{\varepsilon} + 11$$

$$= \frac{a}{\varepsilon}(n^k - kn + \varepsilon a) + 11 \xrightarrow{\frac{-b}{2a} = v} \frac{a}{\varepsilon}(0) + 11 = 11$$



$$f(n) = kn - \varepsilon$$

$$f \circ g(n) = kn^k - \varepsilon n - 1$$

$$g \circ f(n) = ?$$

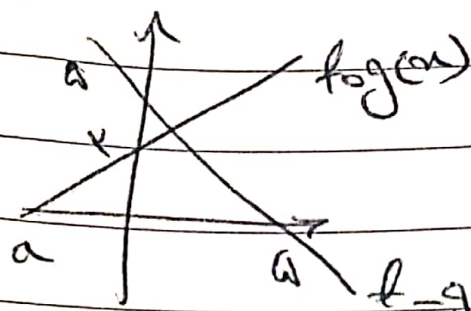
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$$f \circ g = kn^k - \varepsilon n - 1 = kn^k - \varepsilon n - 1$$

$$kn^k - \varepsilon n - 1 = kn^k - \varepsilon n + 1 \rightarrow g(n) = n^k - \varepsilon n + 1 = (n-1)^k$$

$$g \circ f = g(f(n)) = (f(n) - 1)^k = (kn - \varepsilon - 1)^k = (kn - \varepsilon - 1)^k$$



$$g(n) = kf(n) - 1 \quad (a)$$

$$a = ?$$

$$g(n) = \frac{k}{r} f(n) - v$$

$$f - g = -n + a$$

$$f(n) - \frac{k}{r} f(n) - v = -n + a$$

$$f(n) - \frac{k}{r} f(n) = -n + 1 \rightarrow f(n) = kn + 1$$

$$g(n) = \frac{k}{r} (kn + 1) - v = kn - 1$$

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

$$kn + 1 = 0 \rightarrow n = -\frac{1}{k} \rightarrow a = -\frac{1}{k}$$

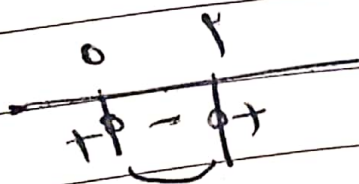
$$f(n) = n^r \quad g(n) = \log_r^n \quad (2)$$

$$f \circ g(n) \leq g \circ f(n)$$

$$f \circ g = r \log_r^n = n \log_r^r = n^r$$

$$g \circ f(n) = \log_r^{n^r} = n \log_r^r = rn$$

$$n^r \leq rn \rightarrow n^{r-1} \leq r \rightarrow n(n-1) \leq 0$$



$$\{0, 1\} \rightarrow \underline{[0, 1]}$$

$$f\left(\frac{n^2-r}{n}\right) = n^2 + n - \varepsilon - \frac{r}{n} + \frac{\varepsilon}{n^2} \quad (v)$$

$$f(n) = ?$$

$$\frac{n^2-r}{n} = n - \frac{r}{n} \quad \checkmark$$

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

$$\rightarrow f(n) = n + n^2 \quad \checkmark$$

$$f(n) = \log_r^n \quad g(n) = \ln - n^2 \quad (v) \quad (1)$$

$$A = D \circ f \circ g \quad B = R \circ f \circ g \quad A \cap B = ?$$

$$f \circ g = \log_r^{\ln - n^2} \rightarrow D = \ln - n^2 \neq 0 \quad \begin{matrix} 0 & \wedge \\ - & + & - \end{matrix}$$

$$D = (0, \wedge)$$

$$R \Rightarrow \frac{-b}{4a} \rightarrow \frac{-1}{-1} = \varepsilon \rightarrow \ln - n^2 = 1^2 - 1^2 = 0$$

$$\log_r^1 = \varepsilon \rightarrow R = (-\infty, \varepsilon)$$

$$A \cap B = (0, \varepsilon] \rightarrow \{1, 2, 3, \varepsilon\} \rightarrow \varepsilon$$

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$$f \circ f(n) = 1 - 3f(n)$$

$$g(n) = n - 1$$

$$h(n) = n^3 + 2n + 1$$

$$h(g(n)) = f(n)$$

$$f(f(n)) = 1 - 3f(n) \rightarrow f(n) = 1 - 3n^3$$

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

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

$$\rightarrow n^3 + 4n = 3 = 0 \rightarrow \text{no solution}$$

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$$f(n) = n - \frac{\epsilon}{n}$$

$$g \circ f(n) = an^3 + 2n$$

$$g(f) = 1$$

$$f(n) = f \rightarrow n - \frac{\epsilon}{n} = f \rightarrow n^2 - fn - \epsilon = 0 \rightarrow n = -1 \rightarrow n = \epsilon$$

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$$g(f) = 1 \rightarrow a(-1)^3 + 2(-1) = 1$$

$$\rightarrow a(\epsilon)^3 + 2(\epsilon) = 1$$

$$-a - 2 = 1 \rightarrow -a = 3 \rightarrow a = -3$$

$$9\epsilon^3 + 2\epsilon = 1 \rightarrow a = 0$$