

ب. $\sqrt{2}$

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سوره مداری

$$f_{(n)} = \begin{cases} \cot \frac{\pi n}{r} & , n \leq 1 \\ \sqrt{2r+1} & , n > 1 \end{cases}$$

$$\log(f_{(n)})$$

$$f(f_{(n)}) \Rightarrow f$$

$$f(\frac{r}{r}) = \cot \frac{\pi n}{r} \Rightarrow \cot \frac{\pi}{r} \Rightarrow \sqrt{r}$$

$$f(\sqrt{r}) = \sqrt{(\sqrt{r})^2 + 1} = \sqrt{r+1}$$

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$$f(\frac{1}{n}) = \sqrt{\frac{r-1}{nr}}$$

$$g_{(n)} = r \cos^n n$$

$$\Rightarrow f_{(n)} = [n] \quad g_{(n)} = \frac{n}{1-n}$$

$$\log(\frac{\pi}{r}) = : \quad g(\frac{\pi}{r}) = r \cos^n \pi = r \times \frac{1}{2} = \frac{r}{2}$$

$$\log(\sqrt{r}) = : \quad g(\sqrt{r}) = \frac{\sqrt{r}}{1-\sqrt{r}} \times \frac{1+\sqrt{r}}{1+\sqrt{r}} = \frac{\sqrt{r}+r}{-1} \quad 2$$

$$f(\frac{1}{n}) = f(\frac{1}{r}) \quad f(r) = \sqrt{\frac{r-1}{r}} \Rightarrow \sqrt{\frac{r}{r}}$$

$$f(-\sqrt{r}-r) = [-\sqrt{r}-r] = -K \quad -\sqrt{r}-r$$

$$f_{(n)} = \sin n$$

$$f(\frac{\pi}{2}) = \sin \frac{\pi}{2} = \frac{\sqrt{r}}{r}$$

$$g_{(n)} = n \sqrt{1-n^2}$$

$$g(\frac{\sqrt{r}}{r}) = \frac{\sqrt{r}}{r} \sqrt{1-\frac{r}{r}} = \frac{\sqrt{r}}{r} \sqrt{\frac{1}{r}} = \frac{1}{r} \times \frac{\sqrt{r}}{r} = \sqrt{\frac{1}{r}} \quad 3$$

$$g \circ f(\frac{\pi}{2}) = :$$

$$f_{(n)} = \{(r, a), (q, a), (1, 12), (1, 12)\}$$

$$\Rightarrow g \circ f_{(n)} \quad \emptyset$$

$$g_{(n)} = \{(r, 4), (r, 4), (r, 1), (1, 10)\}$$

$$f \circ g_{(n)} \quad \{(r, a), (r, a), (q, 12), (1, 12)\} \quad g \circ f_{(n)} \quad \emptyset$$

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$$g \circ g_{(n)} \quad \{(r, 1), (r, 4), (q, 10)\}$$

$$f = \{(r, 1), (r, 2), (r, a), (1, v)\}$$

$$g = \{(1, r), (r, 1), (a, r), (b, 1)\}$$

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$$(r, 2) \in f \circ g \Rightarrow g_{(n)} = t \Rightarrow f(t) = r \Rightarrow t = r \Rightarrow n = a \Rightarrow a = r$$

$$(r, 1) \in g \circ f \quad g(f_{(n)}) = 1 \quad f_{(n)} = b \Rightarrow (r, a) \Rightarrow b = a \Rightarrow \boxed{(r, a)}$$

$$(a, b) = t$$

$$f, g \rightarrow \text{خطی} \quad f(n) = n+1 \rightarrow g(f(-1)) = \boxed{-1}$$

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

$$g(n+2) = n+1 \quad f(n) = a(n+b)+b = an+ab+b = n+2$$

$$g \circ f(-1) = ?$$

$$a^2 = \varepsilon \quad \begin{cases} a > 1 \rightarrow b = 1 \\ a < -1 \rightarrow b = -1 \end{cases}$$

$$g(n) = cn+d$$

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$$rc = r \rightarrow c = \frac{r}{r}$$

$$g(n+2) = c(n+2) + d = n+2 \Rightarrow rc + d = -1 \Rightarrow d = -1 - r$$

$$f(n) = \sqrt{n+1}$$

$$f(n) = \begin{cases} \sqrt{n} & n \geq 0 \\ 0 & n < 0 \end{cases}$$

$$Dg = \mathbb{R} - \{0, \varepsilon\}$$

$$\sqrt{n+1} \neq \{0, \varepsilon\}$$

$$Dg \circ f = ?$$

$$\sqrt{n+1} \neq 0 \rightarrow n > -1$$

$$\sqrt{n+1} \neq \varepsilon \rightarrow n \neq \varepsilon - 1$$

$$Dg \circ f = (-1, +\infty) - \{\varepsilon\}$$

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

$$\{n \in Df, f(n) \in Dg\} \Rightarrow [-1, 1]$$

$$g(n) = \sqrt{n}$$

$$\sqrt{1-n^2} \in [0, 1] \Rightarrow 0 \leq \sqrt{1-n^2} \leq 1 \Rightarrow 0 \leq 1-n^2 \leq 1$$

$$D(f \circ g + g \circ f) = ?$$

$$\textcircled{1} -1 \leq -n^2 \leq 0 \rightarrow 0 \leq n^2 \leq 1 \Rightarrow -1 \leq n \leq 1 \textcircled{2}$$

$$Df = \frac{-1}{-1+0} \cup \frac{+1}{0+0} Df = [-1, 1]$$

$$D(f+g) = Df \cap Dg = [-1, 1] \cap [0, +\infty) \rightarrow [0, 1]$$

$$Dg = [0, +\infty)$$

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

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

$$f(n) = ? \quad \frac{n+1}{n-2} = t$$

$$f(n) = ? \quad \left(n + \frac{1}{n}\right) = t$$

$$f(t) = \frac{t^2+1}{t-2} + 2$$

$$t^2 = n^2 + \frac{1}{n^2} + 2\left(n + \frac{1}{n}\right) \Rightarrow t^2 = n^2 + \frac{1}{n^2} + 2n + \frac{2}{n}$$

$$n = \frac{t^2+1}{t-2} \rightarrow f(n) = \frac{1 \cdot t^2 - 1}{n-2}$$

$$n^2 + \frac{1}{n^2} = t^2 - 2t \quad f(t) = t^2 - \frac{1}{t^2}$$

$$f(n) = n\sqrt{n}$$

$$n \geq 0$$

نیز می بینیم که f و g در $n=0$ و $n=1$ به هم می رسند و در $n=0$ و $n=1$ به هم می رسند.

$$g(f(n)) = 0$$

$$g(n) = 0$$

$$n_1 = 1$$

$$n_2 = 2\sqrt{2}$$

$$f(n) = \begin{cases} n > 1 \Rightarrow n\sqrt{n} = 1 \Rightarrow n_1' = 1 \\ n_1 = 2\sqrt{2} \Rightarrow n\sqrt{n} = 2\sqrt{2} \Rightarrow n_2' = 2 \end{cases}$$

$$n_2' - n_1' = 2 - 1 = 1$$