

۲. اولین عالمی نوبت

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

$$\Rightarrow f(n) = \frac{1}{n+1} - \frac{1}{n} = \frac{n - (n+1)}{(n+1)n} = \frac{-1}{n(n+1)}$$

$D_f = (-\infty, 0) \cup (1, +\infty)$

$$f(n) = \sqrt{\left(\frac{1}{n}\right)^2 - 9} \rightarrow \frac{1}{n^2} - 9 \rightarrow \frac{1 - 9n^2}{n^2} \rightarrow \frac{(1-3n)(1+3n)}{n^2}$$

$$n \in [1, 12], y = (1 - \sqrt{1-n})^2 - 1$$

$$f(n) = \frac{\log \varepsilon}{\sqrt{n-1} + 1} \rightarrow a+b = ?$$

$D_f = (-\infty, -1) \cup (1, +\infty)$

$$f(n) = \sqrt{a \tan n - n} \rightarrow D_f = [-2, \frac{\pi}{2}] \quad | \quad a+b = ?$$

$$n = -2 \rightarrow -2a - 1 = 0 \rightarrow a = -\frac{1}{2} \Rightarrow \sqrt{2 - \frac{1}{2}n - n} \rightarrow \sqrt{2 - \frac{3}{2}n}$$

$a+b = -\frac{1}{2} + \frac{\pi}{2} = \frac{\pi-1}{2}$

$$f(n) = \begin{cases} n-1 & n \geq 1 \\ n+2 & n < 1 \end{cases} \quad g(n) = \sqrt{f(n) - n} \quad | \quad D_g = ?$$

صورت $(n \geq 1) \rightarrow n-1-n \geq 0 \rightarrow n-1 \geq 0 \rightarrow n \geq 1$

صورت $(n < 1) \rightarrow n+2-n \geq 0 \rightarrow 2 \geq 0$

$D_g = [-2, +\infty)$

$$f(n) = r^n - \varepsilon n \quad / \quad f(\sin \frac{\pi}{r} + \cos \frac{\pi}{r}) = ?$$

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$$f(1 \cdot \frac{\sqrt{r}}{r} + 1)$$

$$r(1 + \frac{\sqrt{r}}{r})^2 - \varepsilon(1 + \frac{\sqrt{r}}{r})$$

$$r + \frac{r}{r} + r \frac{\sqrt{r}}{r} - \varepsilon - \varepsilon \frac{\sqrt{r}}{r} \rightarrow \frac{r}{r} - \frac{\varepsilon}{r} = \boxed{-\frac{1}{r}}$$

6

$$f(n) = \frac{n+1}{n-1}$$

$$f(f(a)) = a$$

$$f\left(\frac{a+1}{a-1}\right) \rightarrow \frac{\frac{a+1}{a-1} + 1}{\frac{a+1}{a-1} - 1} = a \rightarrow \frac{\frac{2a}{a-1}}{\frac{2}{a-1}} = a$$

بالاترین اعداد صحیح به هم می رسند!

$$12 \neq 12 - \{+1\}$$

7

$$f(n) = n^2 - \varepsilon n$$

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

$$\sqrt{a^2 - 1} \rightarrow f(\sqrt{a^2 - 1}) = ? \rightarrow (\sqrt{a^2 - 1})^2 - \varepsilon(\sqrt{a^2 - 1}) = -\varepsilon$$

$$f(g(a)) = -\varepsilon$$

$$a = ?$$

Ⓟ

$$t^2 - \varepsilon t + \varepsilon = 0 \rightarrow (t - \varepsilon)^2 = 0 \rightarrow t = \varepsilon$$

$$a = \pm \sqrt{\varepsilon}$$

$$a^2 - 1 = \varepsilon \rightarrow a^2 = \varepsilon + 1 \rightarrow a = \pm \sqrt{\varepsilon + 1}$$

8

$$f(n+5) = n^2 - 8n + 4$$

$$f(5) \times f(-5) = ? \rightarrow 2 \times 144 = 288$$

$$f(5) \rightarrow n=1 \rightarrow f(5) = 1 - 8 + 4 = -3$$

$$f(-5) \rightarrow n=4 \rightarrow f(-5) = (-4)^2 - 8(-4) + 4 = 44$$

9

$$f(\varepsilon \cos^2 n + 8 \cos n) = \tan^2 n \rightarrow f(\varepsilon, 8) = ?$$

$$\varepsilon \cos^2 n + 8 \cos n - \varepsilon, 8 = 0 \rightarrow \varepsilon t^2 + 8t - \varepsilon = 0 \rightarrow \frac{\varepsilon t^2}{\varepsilon} + 1 \cdot t - 1 = 0$$

$$(0 \cdot 0) \cos n \neq \frac{\varepsilon}{\varepsilon} \rightarrow t = \frac{\varepsilon}{\varepsilon} = 1$$

$$\frac{\sin^2 n}{\sin^2 n} = 1 - \cos^2 n$$

$$(00) \cos n = \frac{1}{r}$$

$$t = \left(\frac{1}{r}\right)^2$$

$$\Delta = 100 + 4 \varepsilon = 144$$

10

$$\tan^2 n = \frac{\sin^2 n}{\cos^2 n} = \frac{\frac{\varepsilon}{\varepsilon}}{\frac{1}{\varepsilon}} = \varepsilon$$