

A.N.O

درسای صاف زاده - یازدهم دفتر A

Subject:

Year.

Month.

Day.

سوال (1)

$$2n^2 + y^2 - \varepsilon n + 4y + k = 0 \rightarrow \underbrace{2n^2 - \varepsilon n + \frac{\varepsilon^2}{4}}_{2(n^2 - \varepsilon n + \frac{\varepsilon^2}{4})} + \underbrace{y^2 + 4y + 4}_{(y+2)^2} = \frac{\varepsilon^2}{2}$$

$$k = 2 + \frac{\varepsilon^2}{2} \quad \text{و} \quad 2n(n-1)^2$$

سوال (2)

$$f(n) = \begin{cases} n^2 + \varepsilon n & ; n \geq a \\ 2n + a + 2 & ; n < a \end{cases} \quad \begin{aligned} a^2 + \varepsilon a &= 2a + a + 2 \\ a^2 + a - 2 &= 0 \rightarrow (a+2)(a-1) = 0 \\ \rightarrow a &= -2, 1 \text{ و } a > 0 \end{aligned}$$

$\Rightarrow f(1) \rightarrow 1^2 + \varepsilon(1) \rightarrow 1 + \varepsilon(1) = 2$

سوال (3) $a+b=?$

$$f(n) = \begin{cases} n^2 - b & ; |n+1| \geq 2 \rightarrow n+1 \geq 2 \rightarrow n \geq 1 \\ & \rightarrow n+1 \leq -2 \rightarrow n \leq -3 \\ a+2n & ; -3 \leq n \leq -1 \end{cases}$$

$n = -3 \rightarrow 1 - b = a - 4 \rightarrow a + b = 24$

سوال (4) $\sqrt{4n-a} + \sqrt{b-3n}$ بزرگترین مقدار را بیابید.

$$\begin{aligned} 4n - a &\geq 0 \rightarrow a \leq 4n \rightarrow n \geq \frac{a}{4} \Rightarrow \frac{a}{4} \leq 2 \Rightarrow a \leq 8 \\ b - 3n &\geq 0 \rightarrow 3n \leq b \rightarrow n \leq \frac{b}{3} \Rightarrow \frac{b}{3} \geq 2 \Rightarrow b \geq 6 \end{aligned}$$

سوال (5) $y = \sqrt{\frac{n^2 - n - 4}{n^2 - 13n^2 + 44}}$

$$= \sqrt{\frac{(n-4)(n+1)}{(n^2-4)(n^2-9)}} = \sqrt{\frac{(n-4)(n+1)}{(n+2)(n-2)(n+3)(n-3)}}$$

$\rightarrow n \in \mathbb{R}^+ \setminus \{-2, -3, 2, 3\}$

نقطه بحرانی: $-\frac{1}{2}, -\frac{1}{3}, \frac{1}{2}, \frac{1}{3}$

$\rightarrow D_f = (-\infty, -\frac{1}{2}) \cup (\frac{1}{3}, 2) \cup (3, +\infty)$

سوال (6) $\sqrt{\frac{n^2 - 2n^2 - 8n + 4}{n^2 + 2n^2 - 8n - 4}}$

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

$\rightarrow n \in \mathbb{R}^+ \setminus \{-2, -3, -1, 2, 3\}$

$\rightarrow D_f = (-\infty, -\frac{1}{2}) \cup [\frac{1}{2}, 1) \cup [2, 3) \cup (3, +\infty)$



$$2n^2 + y^2 - \varepsilon n + 4y + k = 0 \rightarrow \underbrace{2n^2 - \varepsilon n + 0}_{\frac{2(n^2 - \varepsilon n + 1)}{2n(n-1)^2}} + \underbrace{y^2 - 4y + 4}_{(y-2)^2} = 0 \quad \text{سوال (1)}$$

$$k = 2 + 9 = 11$$

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$$f(n) = \begin{cases} n^2 + \varepsilon n & ; n \geq a \\ 2n + a + 2 & ; n < a \end{cases} \quad \begin{aligned} a^2 + \varepsilon a &= 2a + a + 2 \\ a^2 + a - 2 &= 0 \rightarrow (a+2)(a-1) = 0 \\ \rightarrow a &= -2, 1 \rightarrow a = 1 \end{aligned} \quad \text{سوال (2)}$$

$$\Rightarrow f(1) \rightarrow n^2 + \varepsilon n \rightarrow 1 + \varepsilon(1) = 2$$

$$f(n) = \begin{cases} n^2 - b & ; |n+1| \geq 2 \rightarrow n+1 \geq 2 \rightarrow n \geq 1 \\ & \rightarrow n+1 \leq -2 \rightarrow n \leq -3 \\ a+2n & ; -3 \leq n \leq -1 \end{cases} \quad \text{سوال 3: } a+b=?$$

$$n = -2 \rightarrow 1n - b = a - 4 \rightarrow a + b = 24$$

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سوال (4): اگر دایره $\sqrt{4n-a} + \sqrt{b-3n}$ و y برابر $\{2\}$ باشد، $\frac{b}{a} = ?$

$$\begin{aligned} 4n - a \geq 0 &\rightarrow a \leq 4n \rightarrow n \geq \frac{a}{4} \Rightarrow \frac{a}{4} = 2 \Rightarrow a = 8 \\ b - 3n \geq 0 &\rightarrow 3n \leq b \rightarrow n \leq \frac{b}{3} \Rightarrow \frac{b}{3} = 2 \Rightarrow b = 6 \end{aligned} \quad \left\{ \frac{4}{12}, \frac{1}{3} \right\}$$

همه با سوال 4 تا 6 را برشمار.

$$y = \sqrt{\frac{n^2 - n - 4}{n^2 - 13n^2 + 24}} = \sqrt{\frac{(n-4)(n+1)}{(n^2-4)(n^2-9)}} = \sqrt{\frac{(n-4)(n+1)}{(n+2)(n-2)(n+3)(n-3)}}$$

$$\rightarrow n \leq 3^*, -2^*, 2, -3 \quad \begin{array}{ccccccc} & -3 & -2^* & 2 & 3^* & & \\ & | & | & | & | & & \\ + & - & - & + & + & & \end{array} \rightarrow D_f = (-\infty, -3) \cup (3^*, \infty)$$

$$y = \sqrt{\frac{n^2 - 2n^2 - 8n + 4}{n^2 + 2n^2 - 8n - 4}} = \sqrt{\frac{(n-1)(n^2 - n - 4)}{(n+1)(n^2 + n - 4)}} = \sqrt{\frac{(n-1)(n-4)(n+2)}{(n+1)(n+3)(n-2)}}$$

$$\begin{array}{ccccccc} & -3 & -2 & -1 & 1 & 2 & 3 \\ & | & | & | & | & | & | \\ + & - & - & - & + & - & + \end{array} \rightarrow D_f = (-\infty, -3) \cup [-2, -1) \cup [1, 2) \cup [3, +\infty)$$

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الف) $y = \sqrt{\frac{n+1}{n-4}} + \sqrt{\frac{4-n}{n^2+n+4}}$

$\frac{n+1}{n-4} \geq 0 \rightarrow n < -1 \text{ or } n > 4$

$\frac{4-n}{n^2+n+4} \geq 0 \rightarrow n \in (-\infty, 4]$

$\Rightarrow (-\infty, -1) \cup (4, +\infty) \cap (-\infty, 4] = (-\infty, -1) \cup \{4\}$

$\Rightarrow D_f = \{4\}$

ب) $y = \sqrt{[n]-2} + \sqrt{2-[n]} \rightarrow [n]-2 \geq 0 \rightarrow [n] \geq 2 \rightarrow (-\infty, 3]$

$[n]-2 \geq 0 \rightarrow [n] \geq 2 \rightarrow n \in [2, +\infty)$

$\Rightarrow (-\infty, 3] \cap [2, +\infty) = [2, 3]$

$\Rightarrow D_f = \emptyset$

ج) $y = \sqrt{[-n]-2} \rightarrow [-n]-2 \geq 0 \rightarrow [-n] \geq 2 \rightarrow D_f = (-\infty, -3]$

$(-\infty, -3]$

د) $y = \frac{2n^2+4}{[n]^2-2[n]-3} \rightarrow [n]^2-2[n]-3 > 0 \rightarrow ([n]-3)([n]+1) > 0$

$[n] < -1 \rightarrow [n] \leq -2 \rightarrow n \in (-\infty, -2)$

$[n] > 3 \rightarrow [n] \geq 4 \rightarrow n \in [4, +\infty)$

$\Rightarrow D_f = \mathbb{R} - [-2, 4)$

هـ) $y = \frac{\cot n + 1}{\tan n + 1} = \frac{\frac{\cos n}{\sin n} + 1}{\frac{\sin n}{\cos n} + 1} \rightarrow \sin n \neq 0 \rightarrow \bigoplus$

$\frac{\sin n}{\cos n} + 1 \rightarrow \sin n \neq -1 \rightarrow \bigoplus$

$D_f = \{k\pi, k\pi - \pi\}$

$y = \frac{\cot n + 1}{\tan n + 1} = \frac{\frac{\cos n}{\sin n} + 1}{\frac{\sin n}{\cos n} + 1} \rightarrow \sin n \neq 0 \rightarrow \text{Diagram 1}$
 $\frac{\sin n}{\cos n} + 1 \rightarrow \frac{\sin n}{\cos n} \neq -1 \rightarrow \text{Diagram 2}$
 $\rightarrow \cos n \neq 0 \rightarrow \text{Diagram 3}$
 $D_f = \left\{ \frac{k\pi}{r}, k\pi - \frac{\pi}{\varepsilon} \right\}$

$y = \sqrt{1 - \varepsilon \sin^2 n} \rightarrow 1 - \varepsilon \sin^2 n \geq 0 \rightarrow \varepsilon \sin^2 n \leq 1 \rightarrow \sin^2 n \leq \frac{1}{\varepsilon} \rightarrow -\frac{1}{\sqrt{\varepsilon}} \leq \sin n \leq \frac{1}{\sqrt{\varepsilon}}$
 $D_f = \left[k\pi - \frac{\pi}{4}, k\pi + \frac{\pi}{4} \right]$

$y = \sqrt{1 - \log_{\frac{1}{\varepsilon}}^{n-1}} \rightarrow 1 - \log_{\frac{1}{\varepsilon}}^{n-1} \geq 0 \rightarrow \log_{\frac{1}{\varepsilon}}^{n-1} \leq 1 \rightarrow n-1 \geq \frac{1}{\varepsilon} \rightarrow n \geq \frac{1}{\varepsilon} + 1$
 $D_f = \left[\frac{n}{\varepsilon} + \infty \right)$

$y = \frac{\sqrt{n^2 - n}}{1 - \log_{\varepsilon}^{n^2 - n}} \rightarrow 1 - \log_{\varepsilon}^{n^2 - n} \neq 0 \rightarrow \log_{\varepsilon}^{n^2 - n} \neq 1 \rightarrow n(n-1) \neq \varepsilon$
 $n^2 - n - \varepsilon \neq 0$
 $(n - \varepsilon)(n + 1) \neq 0$
 $\rightarrow n(n-1) \geq 0$
 $\rightarrow n \in (-\infty, 0] \cup [1, +\infty)$

Diagram 4
 Diagram 5
 Diagram 6
 Diagram 7
 Diagram 8
 Diagram 9
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 Diagram 97
 Diagram 98
 Diagram 99
 Diagram 100

الف) $y = \sqrt{\epsilon n - n^2}$ $\rightarrow \epsilon n - n^2 \geq 0$ $\epsilon n - n^2 \geq 0 \rightarrow -n^2 + \epsilon n \geq 0$ $-(n - \epsilon)(n - 1) \geq 0$ $\frac{1}{\epsilon} \quad 1$

$D_f = [1, \epsilon]$

ب) $y = \left(\frac{rn + \delta}{rn + \epsilon} \right)!$ $\frac{rn + \delta}{rn + \epsilon} \in \omega \rightarrow rn + \delta \in rn\omega + \epsilon\omega$

$rn - rn\omega \in \epsilon\omega - \delta$

$n(r - r\omega) \in \epsilon\omega - \delta$

$D_f = \left\{ n \mid n \leq \frac{\epsilon\omega - \delta}{\epsilon - r\omega} \right\}$

$n \in \frac{\epsilon\omega - \delta}{\epsilon - r\omega}$

