

الف) $y = \frac{x+3}{x^2+x^2-11x+6} \Rightarrow \frac{x+3}{(x-1)(x-1)(x+3)} \Rightarrow$ خرج نباید صفر باشد

$(x-1)(x-1)(x+3) \neq 0 \Rightarrow x \neq 1, -3 \Rightarrow D_f = \mathbb{R} - \{1, -3\}$

ب) $y = \frac{x+3}{x^2+9x^2+11x+6} \Rightarrow \frac{x+3}{(x+1)(x+1)(x+6)} \Rightarrow$ خرج نباید صفر باشد

$\Rightarrow (x+1)(x+1)(x+6) \neq 0 \Rightarrow x \neq -1, -6 \Rightarrow D_f = \mathbb{R} - \{-1, -6\}$

الف) $y = \frac{x+6}{x^2-2x^2+2x-1} \Rightarrow \frac{x+6}{(x-1)(x^2-x+1)} \Rightarrow$ خرج نباید صفر باشد

$(x-1)(x^2-x+1) \neq 0 \Rightarrow x \neq 1 \Rightarrow D_f = \mathbb{R} - \{1\}$

ب) $y = \sqrt{\frac{x+6}{x^2-2x^2+2x-1}} \Rightarrow \frac{x+6}{x^2-2x^2+2x-1} \geq 0 \Rightarrow \frac{x+6}{(x-1)(x^2-x+1)} \geq 0$

$\Rightarrow D_f = (-\infty, -3] \cup (1, +\infty) = \mathbb{R} - (-3, 1)$

$y = \frac{2}{x^2-5|x-1|-2x+8} \Rightarrow x^2-5|x-1|-2x+8 \neq 0$

$\rightarrow x \geq 1 \Rightarrow x^2-5x+5-2x+8 \neq 0 \Rightarrow x^2-7x+13 \neq 0 \Rightarrow (x-4)(x-3) \neq 0$

$\rightarrow x < 1 \Rightarrow x^2+5x-5-2x+8 \neq 0 \Rightarrow x^2+3x+3 \neq 0 \Rightarrow x(x+3) \neq 0$

$x \neq 0, -3 \Rightarrow D_f = \mathbb{R} - \{0, 3, 4, -3\}$

الف) $y = \sqrt{[x]-2} \Rightarrow [x]-2 \geq 0 \Rightarrow [x] \geq 2 \Rightarrow -x \geq 2$

$x \leq -2 \Rightarrow D_f = (-\infty, -2]$

ب) $y = \frac{5x^2+4}{[x]^2-2[x]-6} \Rightarrow \frac{5x^2+4}{([x]-2)([x]+3)} \Rightarrow ([x]-2)([x]+3) \neq 0$

$\left\{ \begin{array}{l} [x] \neq 2 \Rightarrow x \notin [2, 3) \\ [x] \neq -3 \Rightarrow x \notin [-3, -2) \end{array} \right\} \Rightarrow D_f = \mathbb{R} - ([2, 3) \cup [-3, -2))$

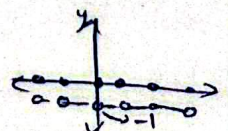
الف) $y = \sqrt{[x-\frac{1}{2}]+[x+\frac{1}{2}]} \Rightarrow [x-\frac{1}{2}]+[x+\frac{1}{2}] \geq 0$ مقادیر صحیح

$[x-\frac{1}{2}]+1+[x+\frac{1}{2}] \geq 1 \Rightarrow 2[x+\frac{1}{2}] \geq 1 \Rightarrow [x+\frac{1}{2}] \geq \frac{1}{2} \Rightarrow [x+\frac{1}{2}] \geq 1$

$x+\frac{1}{2} \geq 1 \Rightarrow x \geq \frac{1}{2} \Rightarrow D_f = [\frac{1}{2}, +\infty)$

ب) $y = \sqrt{[x-\frac{1}{2}]+[\frac{1}{2}-x]} \Rightarrow [x-\frac{1}{2}]+[\frac{1}{2}-x] \geq 0$ مقادیر صحیح

$\Rightarrow x-\frac{1}{2} \in \mathbb{Z} \Rightarrow x \in \mathbb{Z} + \frac{1}{2} \Rightarrow D_f = \{x | x = k + \frac{1}{2}, k \in \mathbb{Z}\}$



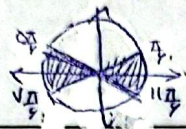
$[0] + [-0] = 0$

$$\text{a)} \quad y = \frac{\cos n + 1}{\tan n + 1} = \frac{\frac{\cos n}{\sin n} + 1}{\frac{\sin n}{\cos n} + 1} \Rightarrow \begin{cases} \sin n \neq 0 \Rightarrow \mathbb{R} - \{k\pi\} \\ \cos n \neq 0 \Rightarrow \mathbb{R} - \{k\pi + \frac{\pi}{2}\} \\ \tan n \neq -1 \Rightarrow \mathbb{R} - \{k\pi - \frac{\pi}{4}\} \end{cases}$$

$$\Rightarrow D_f = \mathbb{R} - \left\{ \frac{k\pi}{4}, k\pi - \frac{\pi}{4} \right\}$$

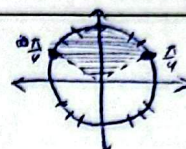
$$\text{b)} \quad y = \sqrt{1 - \varepsilon \sin^2 n} \Rightarrow 1 - \varepsilon \sin^2 n \geq 0 \Rightarrow \varepsilon \sin^2 n \leq 1 \Rightarrow \sin^2 n \leq \frac{1}{\varepsilon}$$

$$-\frac{1}{\sqrt{\varepsilon}} \leq \sin n \leq \frac{1}{\sqrt{\varepsilon}}$$



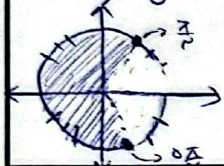
$$D_f = \left[k\pi - \frac{\pi}{4}, k\pi + \frac{\pi}{4} \right]$$

$$\text{a)} \quad y = \sqrt{r \sin n - 1} \Rightarrow r \sin n - 1 \geq 0 \Rightarrow \sin n \geq \frac{1}{r}$$



$$D_f = \left[k\pi + \frac{\pi}{4}, k\pi + \frac{3\pi}{4} \right]$$

$$\text{b)} \quad y = \sqrt{1 - r \cos n} \Rightarrow 1 - r \cos n \geq 0 \Rightarrow r \cos n \leq 1 \Rightarrow \cos n \leq \frac{1}{r}$$



$$D_f = \left[k\pi + \frac{\pi}{2}, k\pi + \frac{3\pi}{2} \right]$$

$$\text{a)} \quad y = \arcsin(n^2 + cn + 1) \Rightarrow -1 \leq n^2 + cn + 1 \leq 1 \Rightarrow \begin{cases} n^2 + cn + 1 \geq -1 \\ n^2 + cn + 1 \leq 1 \end{cases}$$

$$\begin{aligned} n^2 + cn + 1 &\geq -1 \Rightarrow (n+1)(n+c) \geq -2 \\ n^2 + cn &\leq 0 \Rightarrow n(n+c) \leq 0 \end{aligned}$$

$$\begin{aligned} &\text{Number line for } n^2 + cn + 1 \geq -1: \text{ roots at } -1, -c-1 \Rightarrow (-\infty, -1] \cup [-c-1, \infty) \\ &\text{Number line for } n(n+c) \leq 0: \text{ roots at } 0, -c \Rightarrow [-c, 0] \end{aligned}$$

$$\Rightarrow D_f = [-c, -1] \cup [-c-1, 0]$$

$$\text{b)} \quad \cos y = \sqrt{\delta - rn}$$

$$\text{c)} \quad \delta - rn \geq 0 \Rightarrow rn \leq \delta \Rightarrow n \leq \frac{\delta}{r} \Rightarrow \begin{cases} -1 \leq \sqrt{\delta - rn} \leq 1 \\ \sqrt{\delta - rn} \leq 1 \Rightarrow \delta - rn \leq 1 \Rightarrow -\delta \leq -rn \leq -\varepsilon \Rightarrow r \leq n \leq \frac{\delta - \varepsilon}{r} \end{cases}$$

$$\Rightarrow D_f = \left[r, \frac{\delta - \varepsilon}{r} \right]$$

$$\text{a)} \quad y = \log_r(1 - \log_2^n) \Rightarrow \begin{cases} 1 - \log_2^n > 0 \Rightarrow \log_2^n < 1 \Rightarrow n < 2 \\ n > 0 \end{cases}$$

$$\Rightarrow D_f = (0, 2)$$

$$\text{b)} \quad y = \log_r\left(1 - \log_{\frac{1}{r}} n\right) \Rightarrow \begin{cases} n > 0 \\ 1 - \log_{\frac{1}{r}} n > 0 \Rightarrow \log_{\frac{1}{r}} n < 1 \Rightarrow n > \frac{1}{r} \end{cases}$$

$$D_f = \left(\frac{1}{r}, \infty \right)$$

$$\text{a)} \quad y = \sqrt{\frac{\varepsilon n - n^r}{r - 1}} \Rightarrow \frac{\varepsilon n - n^r}{r - 1} \geq 0 \Rightarrow \varepsilon n - n^r \geq 0 \Rightarrow$$

$$\varepsilon n - n^r \geq 0 \Rightarrow n^r - \varepsilon n + \varepsilon^2 \leq 0 \Rightarrow (n-1)(n-\varepsilon) \leq 0$$

$$D_f = [1, \varepsilon]$$

$$\text{b)} \quad y = \left(\frac{n + \delta}{r + \varepsilon} \right)^{\frac{1}{r}} \Rightarrow \frac{r(n + \delta)}{r + \varepsilon} \in \mathbb{W} \Rightarrow n \in -\frac{\delta \varepsilon - \delta}{r \varepsilon - r} \Rightarrow n \in \frac{\delta - \varepsilon \varepsilon}{r \varepsilon - r}$$

$$\Rightarrow D_f = \left\{ n \mid n = \frac{\delta - \varepsilon k}{r \varepsilon - r}, k \in \mathbb{W} \right\}$$