

$$f(n) = \sqrt{(a-2)n^2 + an + b} \rightarrow (a-2)n^2 + an + b \geq 0$$

$$\frac{-a \pm \sqrt{a^2 - 4(a-2)b}}{2(a-2)} \rightarrow an + b \geq 0 \rightarrow a \geq 2 \Rightarrow 2n + b \geq 0$$

$$n^2 \text{ اولیای } \rightarrow y + b = 0 \rightarrow b = -y$$

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

$$\Delta < 0 \rightarrow 4 - 4(2 - m^2) < 0 \rightarrow 4 - 8 + 4m^2 < 0 \rightarrow f(m^2 - 1) < 0$$

$$f(m-1)(m+1) < 0$$

$$1 - (-1) = 2$$

$$1 \leftarrow \rightarrow -1$$

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$$\frac{\sqrt{4 - n^2}}{[n] + [-n] + 1} \rightarrow \begin{cases} 4 - n^2 \geq 0 \rightarrow -2 \leq n \leq 2 \\ [n] + [-n] + 1 \neq 0 \rightarrow n \in \mathbb{Z} \end{cases} \rightarrow D_f = \{-2, -1, 0, 1, 2\}$$

$$n = \omega$$

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$$y = \sqrt{n^3 + 3n^2} \rightarrow \sqrt{n^2(n+3)} \rightarrow n^2(n+3) \geq 0$$

$$\frac{-3 \pm \sqrt{9}}{-1 \pm 1} \rightarrow D_f = [-3, +\infty)$$

$$y = \sqrt{\frac{(n^2-1)(n^3-3n^2)}{n^3-1}} \Rightarrow \frac{(n-1)(n+1)n^2(n-3)}{(n-1)(n^2+n+1)} \geq 0$$

$$\frac{-1 \pm \sqrt{1}}{+1 \pm 1} \rightarrow D_f = (-\infty, -1] \cup [3, +\infty) \cup \{0\}$$

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$$y = \sqrt{|x-2| - 3} \xrightarrow{O \geq 0} |x-2| \geq 3 \rightarrow \begin{cases} x-2 \geq 3 \rightarrow x \geq 5 \\ x-2 \leq -3 \rightarrow x \leq -1 \end{cases}$$

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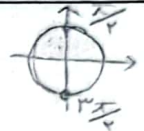
$$y = \sqrt{4 - |2-x|} \xrightarrow{O \geq 0} |2-x| \leq 4 \rightarrow -4 \leq 2-x \leq 4 \rightarrow -6 \leq -x \leq 2$$

$$6 \geq x \geq -2$$

الف) $y = \sqrt{1-x|x|}$ $\begin{cases} x > 0: 1-x^2 \geq 0 \rightarrow -1 \leq x \leq 1 \\ x < 0: 1+x^2 \geq 0 \rightarrow x \in \mathbb{R} \end{cases} \rightarrow [0, 1] \cup (-\infty, 1] = \mathbb{R}$

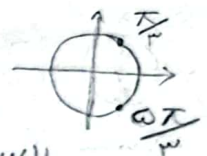
ب) $y = \frac{1}{\sqrt{3-|x-1|}-1}$ $\begin{aligned} 3-|x-1| &\neq 1 \rightarrow |x-1| \neq 2 \rightarrow x \neq 3 \\ &\rightarrow x \neq -1 \\ 3-|x-1| &\geq 0 \rightarrow -3 \leq x-1 \leq 3 \rightarrow -2 \leq x \leq 4 \\ D_f &= [-2, 4] - \{3, -1\} \end{aligned}$

الف) $y = \frac{\sin^2 x - 1}{\cos x} \Rightarrow \cos x \neq 0$ $D_f = \mathbb{R} - \left\{ \frac{k\pi}{2}, \frac{k\pi}{2} \right\}$ $(k \in \mathbb{N})$



ب) $\frac{\cos x}{2\cos x - 1} \Rightarrow 2\cos x \neq 1 \rightarrow \cos x \neq \frac{1}{2}$

$D_f = \mathbb{R} - \left\{ \frac{k\pi}{3}, \frac{k\pi}{3} \right\} (k \in \mathbb{N})$

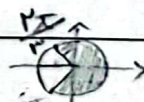


الف) $\frac{n+3}{|2n+1| - |n+3|} \Rightarrow ||2n+1| - |n+3|| \neq 0 \rightarrow |2n+1| \neq |n+3| \rightarrow (2n+1)^2 \neq (n+3)^2$
 $4n^2 + 4n + 1 \neq n^2 + 6n + 9 \rightarrow 3n^2 - 2n - 8 \neq 0 \rightarrow n \neq \frac{2 \pm \sqrt{4 + 96}}{6} = \frac{2 \pm 10}{6} \rightarrow n \neq \frac{12}{6} = 2, n \neq \frac{-8}{6} = -\frac{4}{3}$
 $\begin{aligned} &\begin{cases} 2n+1 > n+3 \rightarrow n > 2 \\ 2n+1 < n+3 \rightarrow n < 2 \end{cases} \\ &\begin{cases} |2n+1| > |n+3| \rightarrow \begin{cases} 2n+1 > n+3 \rightarrow n > 2 \\ 2n+1 < -(n+3) \rightarrow n < -4 \end{cases} \\ |2n+1| < |n+3| \rightarrow \begin{cases} 2n+1 < n+3 \rightarrow n < 2 \\ 2n+1 > -(n+3) \rightarrow n > -4 \end{cases} \end{cases} \end{aligned}$
 $D_f = (-\infty, -\frac{4}{3}] \cup [2, +\infty)$

$f(n) = \sqrt{\frac{\log_{\omega}^{(2n-1)}}{\log_{\omega/2}^{(2n-1)}}} \rightarrow \begin{aligned} &2n-1 > 0 \rightarrow n > \frac{1}{2} \\ &\log_{\omega/2}^{(2n-1)} > 0 \rightarrow 2n-1 > 1 \rightarrow n > 1 \\ &\log_{\omega}^{(2n-1)} \geq 0 \rightarrow \log_{\omega}^{(2n-1)} \leq 1 \rightarrow 2n-1 \leq \omega \rightarrow n \leq \frac{\omega+1}{2} \end{aligned}$
 $D_f = (1, \frac{\omega+1}{2}]$



الف) $y = \log(2\cos x + 1) \rightarrow 2\cos x + 1 > 0 \rightarrow \cos x > -\frac{1}{2}$
 $D_f = \mathbb{R} - \left[\frac{2k\pi + \frac{2\pi}{3}}{2}, \frac{2k\pi + \frac{4\pi}{3}}{2} \right]$



ب) $y = \sqrt{\log \frac{n-1}{n+1}}$ $\begin{aligned} &\frac{n-1}{n+1} > 0 \rightarrow \frac{-1}{-1} < \frac{1}{1} \rightarrow n < -1 \\ &\log \frac{n-1}{n+1} \geq 0 \rightarrow \frac{n-1}{n+1} \geq 1 \rightarrow \frac{n-1-n-1}{n+1} \geq 0 \rightarrow \frac{-2n-2}{n+1} \geq 0 \rightarrow n < -1 \end{aligned}$