

الف) $y = \frac{x+3}{2x^3+3x^2-11x+3} \rightarrow$ تجزیه بر $(x-1)$ $\rightarrow 2x^3+3x^2-11x+3 = (x-1)(2x-1)(x+3) \rightarrow$ ریشه ها: $-3, \frac{1}{2}, 1$
 $\frac{-3}{-\frac{1}{2} + \frac{1}{2} - \frac{1}{2}} \rightarrow \mathcal{D} = \mathbb{R} - \left\{ -3, \frac{1}{2}, 1 \right\} \rightarrow$ جواب

ب) $y = \frac{x+3}{2x^3+9x^2+10x+3} \rightarrow$ تجزیه بر $(x+1)$ $\rightarrow 2x^3+9x^2+10x+3 = (x+3)(2x+1)(x+1)$
 $\rightarrow$ ریشه ها: $-3, -\frac{1}{2}, -1 \rightarrow \mathcal{D} = \mathbb{R} - \left\{ -3, -1, -\frac{1}{2} \right\} \rightarrow$ جواب

الف) $y = \frac{x+3}{x^3-2x^2+2x-1} = \frac{(x-1)(x^2-x+1)}{(x-1)(x^2-x+1)} \rightarrow \mathcal{D} = \mathbb{R} - \{1\} \subseteq (-\infty, 1) \cup (1, +\infty)$
 ← جواب

ب) $y = \sqrt{\frac{x+3}{x^3-2x^2+2x-1}} \rightarrow \frac{x+3}{(x-1)(x^2-x+1)} \geq 0 + \frac{-3}{\frac{1}{2} - \frac{1}{2} + \frac{1}{2}} \rightarrow \mathcal{D} = (-\infty, -3] \cup (1, +\infty)$
 ← جواب

$y = \frac{r}{x^2-a|x-1|-2x+a} \rightarrow x^2-a|x-1|-2x+a \neq 0 \rightarrow x^2-2x+a-a|x-1| \neq 0$
 $\rightarrow (x^2-2x+1)+\varepsilon-a|x-1| \neq 0 \rightarrow \underbrace{(x-1)^2}_{a}-a|x-1|+\varepsilon \neq 0 \rightarrow a^2-a\varepsilon+\varepsilon \neq 0$
 $\rightarrow (a-\varepsilon)(a-1) \neq 0 \rightarrow a \neq 1, a \neq 1 \rightarrow a = |x-1| \rightarrow |x-1| \neq 1 \rightarrow x-1 \neq 1 \rightarrow x \neq 2$
 $|x-1| \neq \varepsilon \rightarrow x-1 \neq \varepsilon \rightarrow x \neq 1+\varepsilon \rightarrow x \neq -3 \rightarrow \mathcal{D} = \mathbb{R} - \{-3, 2, 1+\varepsilon\}$

الف) $y = \sqrt{[-x]-2} \rightarrow [x] \geq 2 \rightarrow -x \geq 2 \rightarrow x \leq -2 \rightarrow \mathcal{D} = (-\infty, -2]$
 ← جواب

ب) $y = \frac{5x^2+6}{[x]^2-2[x]-3} \rightarrow [x]^2-2[x]-3 \neq 0 \rightarrow ([x]-3)([x]+1) \rightarrow [x] \neq 3, -1$
 $\rightarrow \mathcal{D} = (-\infty, -1) \cup (0, 3) \cup [4, +\infty)$
 ← جواب

الف) $y = \sqrt{\left[x-\frac{1}{3}\right] + \left[x+\frac{2}{3}\right]} = \left[x+\frac{2}{3}-1\right] + \left[x+\frac{2}{3}\right] \geq 0 \rightarrow 2\left[x+\frac{2}{3}\right] \geq 1 \rightarrow \left[x+\frac{2}{3}\right] \geq \frac{1}{2}$
 $\rightarrow x+\frac{2}{3} \geq 1 \rightarrow \mathcal{D} = \left[\frac{1}{3}, +\infty\right) \rightarrow$ جواب

ب) $y = \sqrt{\left[x-\frac{1}{3}\right] + \left[\frac{1}{3}-x\right]} \xrightarrow{t=x-\frac{1}{3}} t = \left[\frac{1}{3}-x\right] \rightarrow [t] + [-t] = 0 \rightarrow$ ~~ممنوع است~~
 $x - \frac{1}{3} \in \mathbb{Z} \rightarrow \mathcal{D} = \left\{ \frac{1}{3} + n \mid n \in \mathbb{Z} \right\} \rightarrow$ جواب

ان) $y = \frac{\cos x + 1}{\tan x + 1} \rightarrow \begin{cases} \cos x \neq 0 \\ \sin x \neq 0 \\ \tan x \neq -1 \end{cases} \rightarrow \text{Unit Circle} \rightarrow \underline{D} = \mathbb{R} - \left\{ \frac{k\pi}{2}, k\pi - \frac{\pi}{4} \right\}$

ب) $y = \sqrt{1 - \varepsilon \sin^2 x} \rightarrow 1 - \varepsilon \sin^2 x \geq 0 \rightarrow \sin^2 x \leq \frac{1}{\varepsilon} \rightarrow \sin^2 x \leq \frac{1}{4} \rightarrow -\frac{1}{2} \leq \sin x \leq \frac{1}{2} \rightarrow \underline{D} = \left[k\pi - \frac{\pi}{6}, k\pi + \frac{\pi}{6} \right] \rightarrow \text{جواب}$

ج) $y = \sqrt{2 \sin x - 1} \rightarrow 2 \sin x - 1 \geq 0 \rightarrow 2 \sin x \geq 1 \rightarrow \sin x \geq \frac{1}{2} \rightarrow \text{Unit Circle} \rightarrow \underline{D} = \left[2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6} \right]$

د) $y = \sqrt{1 - 2 \cos x} \rightarrow 1 - 2 \cos x \geq 0 \rightarrow \cos x \leq \frac{1}{2} \rightarrow \text{Unit Circle} \Rightarrow \underline{D} = \left[2k\pi + \frac{\pi}{3}, 2k\pi + \frac{5\pi}{3} \right]$

هـ) $y = \arcsin(x^2 + 2x + 1) \rightarrow -1 \leq x^2 + 2x + 1 \leq 1 \rightarrow x^2 + 2x \leq 0 \rightarrow x(x+2) \leq 0 \rightarrow \begin{cases} x^2 + 2x + 1 \geq 0 \rightarrow (x+1)(x+1) \geq 0 \rightarrow x \leq -1 \text{ or } x \geq -1 \\ x^2 + 2x \leq 0 \rightarrow x(x+2) \leq 0 \rightarrow -2 \leq x \leq 0 \end{cases} \rightarrow \underline{D} = [-2, -1] \cup [-1, 0] \rightarrow \text{جواب}$

و) $\cos y = \sqrt{a - 2x} \rightarrow a - 2x \geq 0 \rightarrow 2x \leq a \rightarrow x \leq \frac{a}{2}$
 $\rightarrow -1 \leq \sqrt{a - 2x} \leq 1 \rightarrow a - 2x \leq 1 \rightarrow -2x \leq 1 - a \rightarrow -2(x - \frac{a}{2}) \leq \frac{1}{2} - \frac{a}{2} \rightarrow x \geq \frac{a-1}{2}$
 $\rightarrow \underline{D} = \left[\frac{a-1}{2}, \frac{a}{2} \right] \rightarrow \text{جواب}$

ز) $y = \log_r(1 - \log_3 x) \rightarrow \begin{cases} x > 0 \\ 1 - \log_3 x > 0 \rightarrow \log_3 x < 1 \rightarrow x < 3 \end{cases} \rightarrow \underline{D} = (0, 3) \rightarrow \text{جواب}$

ح) $y = \log_r(1 - \log_{\frac{1}{r}} x) \rightarrow \begin{cases} x > 0 \\ 1 - \log_{\frac{1}{r}} x > 0 \rightarrow \log_{\frac{1}{r}} x < 1 \rightarrow \log_{\frac{1}{r}} x < \log_{\frac{1}{r}} \frac{1}{r} \rightarrow x > \frac{1}{r} \end{cases} \rightarrow \underline{D} = \left(\frac{1}{r}, +\infty \right) \rightarrow \text{جواب}$

ط) $y = \sqrt{2^{4x-x^2}} - 1 \rightarrow 2^{4x-x^2} \geq 1 \rightarrow 2^{4x-x^2} \geq 2^0 \rightarrow 4x - x^2 \geq 0 \rightarrow x^2 - 4x \leq 0 \rightarrow x(x-4) \leq 0 \rightarrow \underline{D} = [0, 4] \rightarrow \text{جواب}$

ي) $\left(\frac{3x+a}{2x+\varepsilon} \right) \in W \rightarrow \frac{3x+a}{2x+\varepsilon} \in W \rightarrow x = \frac{fk-a}{2-2k} \rightarrow \underline{D} = \left\{ x \mid x \in \frac{fk-a}{2-2k}, k \in W \right\} \rightarrow \text{جواب}$