

$y' = \frac{\sqrt{x^2-4x}}{x^2-x} \rightarrow \frac{x^2-4x}{x^2-x} \geq 0 \rightarrow \frac{x^2-x}{x(x-1)} \geq 0$

$x^2-4x=0 \rightarrow x(x-4)=0 \rightarrow x=0, x=4$

$\text{Sign chart: } \begin{array}{c|ccc} x & -1 & 0 & 1 & 4 \\ \hline & - & + & - & + \end{array}$

$\text{Domain: } (-1, 0) \cup (0, 1) \cup [4, \infty)$

ج. $\sqrt{\frac{x^2-1}{x^2-1}} \rightarrow \frac{x^2-1}{x^2-1} \geq 0 \rightarrow x^2-1 \neq 0 \rightarrow x \neq 0, 1, -1$ ممنوع $\rightarrow D_f = \mathbb{R} - \{0, \pm 1\}$ ب
 $\frac{x^2-1}{x^2-1} \rightarrow$ همیشه برای تمام مقادیر حقیقی
 برابر یا مساوی صفر است

$y = \frac{n+1}{\sqrt{n+|n|}} \rightarrow n+|n| > 0 \rightarrow \begin{cases} n > 0 \Rightarrow n+|n| = 2n > 0 \rightarrow \text{(این رابطه برقرار است)} \\ |n| = -n \Rightarrow n^+(-n) \cdot 0 \neq 0 \rightarrow \text{(این رابطه برقرار نیست)} \end{cases}$
 $\leftarrow$ (یعنی اگر عدد منفی باشد) 1, (0, +\infty)

$y, \frac{1}{\sqrt{x|x|}} \rightarrow x|x| > 0 \rightarrow \begin{cases} \text{حالت 1: اگر عدد مثبت جای } x \text{ قرارم درجه صحت ضرب مورد نظر میش از صورتی بشر} \\ \text{حالت 2: اما اگر جای } x \text{ عدد منفی قرارم چونه ضرب مانیت خط و میزنه حکم ضرب مانیت} \end{cases} \rightarrow \boxed{D(0, \infty)} \text{ (ب. پی)}$

$$j. \sqrt{r - [n]} \rightarrow r - [n] \geq 0 \rightarrow [n] \leq r \rightarrow \boxed{D_r(-\infty, r]}$$

$$y \cdot \frac{1}{\sqrt{p-[n]}} \rightarrow p-[n] > 0 \rightarrow [n] < p \rightarrow \mathcal{D}_2(-\infty, p) \quad (b)$$

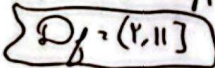
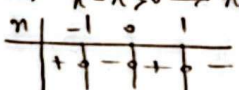
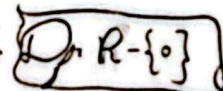
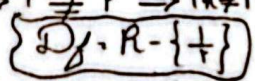
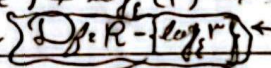
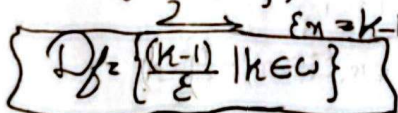
$$\begin{aligned}
 & y \cdot \sqrt{\left[x - \frac{1}{y}\right] + \left[x + \frac{1}{y}\right]} \rightarrow \left[x + \frac{1}{y}\right] + \left[x - \frac{1}{y} + 1\right] - \left[x - \frac{1}{y}\right] + 1 \\
 & \rightarrow \left[x - \frac{1}{y}\right] + \left(\left[x - \frac{1}{y}\right] + 1\right) + 2\left[x - \frac{1}{y}\right] + 1 \xrightarrow{\text{شروطها}} 2\left[x - \frac{1}{y}\right] + 1 \geq 0 \rightarrow \\
 & 2\left[x - \frac{1}{y}\right] \geq -1 \rightarrow \left[x - \frac{1}{y}\right] \geq -\frac{1}{2} \rightarrow \boxed{D_f: \left[\frac{1}{y}, +\infty\right)}
 \end{aligned}$$

$y = \sqrt{\left[n - \frac{1}{n}\right] + \left[-n + \frac{1}{n}\right]} \rightarrow \begin{cases} \text{الف } n = 1 \text{ عدد صحیح باشد حاصل زیر رادیکال ۰ باشد} \\ \text{ی شود که شامل شرط مای باشد} \end{cases} \quad \text{ب)}$

$D_y = \left\{k + \frac{1}{k} \mid k \in \mathbb{Z}\right\} \leftarrow \begin{cases} \text{الف } n = 1 \text{ عدد صحیح باشد حاصل زیر رادیکال منفی} \\ \text{ی شود که شامل شرط مای باشد} \end{cases}$

$\lim_{n \rightarrow \infty} \frac{P}{\sin n - 1} \rightarrow \sin n - 1 \neq 0 \Rightarrow \sin n \neq +1 \rightarrow n \neq 2k\pi + \frac{\pi}{2}$

$$y = \frac{r}{r \sin^{r-1} n} \rightarrow r \sin^{r-1} n \neq 0 \rightarrow r \sin^{r-1} n \neq 1 \rightarrow \sin^{r-1} n \neq \frac{1}{r} \rightarrow \sin n \neq \pm \sqrt[r-1]{\frac{1}{r}} \quad (\leftarrow)$$

$y = \sqrt{1 - \sin x} \rightarrow 1 - \sin x \geq 0 \rightarrow \sin x \leq 1$ $D_f = [2k\pi + \frac{\pi}{2}, 2k\pi + \frac{3\pi}{2}]$	(الف) 	6
$y = \sqrt{\cos x} \rightarrow \cos x \geq 0 \rightarrow \cos x \geq 1$ $D_f = \{2k\pi\}$	(ب) 	
$\cos y, x < 2 \rightarrow -1 \leq x < 1 \rightarrow 1 \leq x \leq 2 \rightarrow \begin{cases} 2 \leq x < 2 \\ 2 \leq x < 2 \end{cases}$ $D_f = [-2, -1] \cup [1, 2]$	(الف) 	7
$y = \arcsin(x^2 + 2x + 1) \rightarrow -1 \leq x^2 + 2x + 1 \leq 1$ $D_f = [-2, -1] \cup [-1, 0]$	(ب) 	
$y = \sqrt{1 - \log_p(n+1)} \rightarrow \begin{cases} 1 - \log_p(n+1) \geq 0 \Rightarrow \log_p(n+1) \leq 1 \Rightarrow n+1 \leq p \Rightarrow n \leq p-1 \\ 1 - \log_p(n+1) \geq 0 \Rightarrow \log_p(n+1) \leq 1 \Rightarrow n+1 \leq p \Rightarrow n \leq p-1 \end{cases}$ $D_f = (2, 11]$	(الف) 	8
$y = \log(n^2 - n) \rightarrow n^2 - n > 0 \rightarrow n(n-1) > 0 \Rightarrow n < 0 \text{ or } n > 1$ $D_f = (-1, 0) \cup (1, +\infty)$	(ب) 	
$y = \frac{r}{\varepsilon^{n+1}} \rightarrow \varepsilon^{n+1} \neq 0 \rightarrow \varepsilon^n \neq -1$ $D_f = \mathbb{R}$	(الف) 	
$y = \frac{r}{\varepsilon^n - 1} \rightarrow \varepsilon^n - 1 \neq 0 \rightarrow \varepsilon^n \neq 1$ $D_f = \mathbb{R} - \{0\}$	(ب) 	9
$y = \frac{r}{\varepsilon^n - 2} \rightarrow \varepsilon^n - 2 \neq 0 \rightarrow \varepsilon^n \neq 2 \rightarrow \varepsilon^n \neq (2^{\frac{1}{n}})^n \rightarrow 2^{\frac{1}{n}} \neq 2^1 \Rightarrow 2^{\frac{1}{n}} \neq 2 \Rightarrow n \neq \frac{1}{2}$ $D_f = \mathbb{R} - \{\frac{1}{2}\}$	(ج) 	
$y = \frac{r}{\varepsilon^n - r} \rightarrow \varepsilon^n - r \neq 0 \rightarrow \varepsilon^n \neq r \rightarrow \log_\varepsilon(\varepsilon^n) \neq \log_\varepsilon(r) \Rightarrow n \neq \log_\varepsilon r$ $D_f = \mathbb{R} - \{\log_\varepsilon r\}$	(د) 	
$y = (\varepsilon n + 1)! \rightarrow \begin{cases} \varepsilon n + 1 \geq 0 \Rightarrow n \geq -\frac{1}{\varepsilon} \\ \varepsilon n + 1 = k (k \in \mathbb{N}, k \geq 0) \end{cases}$ $D_f = \left\{ \frac{k-1}{\varepsilon} \mid k \in \mathbb{N} \right\}$	(الف) 	10
$y = \left(\frac{r_n - r}{r_n - \Delta} \right)! \rightarrow \frac{r_n - r}{r_n - \Delta} = k \rightarrow (k \in \mathbb{N}, k \geq 0)$ $D_f = \left\{ \frac{k-r}{r_n - r} \mid k \in \mathbb{N} \right\}$	(ب) 