

ب) $y = \sqrt{3 - \sqrt{x-2}} \Rightarrow x-2 \geq 0 \Rightarrow x \geq 2$ $3 - \sqrt{x-2} \geq 0 \Rightarrow 3 \geq \sqrt{x-2}$ $\Rightarrow 9 \geq x-2 \Rightarrow 11 \geq x \Rightarrow 2 \leq x \leq 11$ $D_f = [2, 11]$	الف) $y = \sqrt{4 - \sqrt{2-x}} \Rightarrow 2-x \geq 0 \Rightarrow x \leq 2$ $4 - \sqrt{2-x} \geq 0 \Rightarrow 4 \geq \sqrt{2-x} \Rightarrow 16 \geq 2-x$ $\Rightarrow x \geq -14 \Rightarrow D_f = [-14, 2]$	1
ب) $y = \sqrt{3 x -9} \Rightarrow 3 x -9 \geq 0 \Rightarrow 3 x \geq 9 \Rightarrow x \geq 3$ $D_f = (-\infty, -3] \cup [3, +\infty)$ 	الف) $y = \sqrt{4-2x^2} \Rightarrow 4-2x^2 \geq 0 \Rightarrow 2 \geq x^2 \Rightarrow x \leq \sqrt{2}$ $\Rightarrow D_f = [-\sqrt{2}, \sqrt{2}]$	2
ب) $y = \sqrt[3]{\frac{\sqrt{x+1}}{\sqrt{x-3}}} \Rightarrow \frac{\sqrt{x+1}}{\sqrt{x-3}} \geq 0$ $\Rightarrow x \geq -1$ and $x \neq 3$ $D_f = \{x \geq -1, x \neq 3\}$	الف) $y = \sqrt[3]{\frac{ x +1}{ x -3}} \Rightarrow \frac{ x +1}{ x -3} \geq 0$ $\Rightarrow x \neq 3 \Rightarrow D_f = \mathbb{R} - \{\pm 3\}$	3
ب) $y = \frac{\sqrt{4-x^2}}{ x -1} \Rightarrow 4-x^2 \geq 0 \Rightarrow x^2 \leq 4 \Rightarrow -2 \leq x \leq 2$ $x -1 \neq 0 \Rightarrow x \neq \pm 1 \Rightarrow D_f = \{-2 \leq x \leq 2, x \neq \pm 1\}$	الف) $y = \frac{\sqrt{3- x }}{ x +2} \Rightarrow 3- x \geq 0 \Rightarrow x \leq 3 \Rightarrow -3 \leq x \leq 3$ $\Rightarrow D_f = [-3, 3]$	4
ب) $y = \frac{1}{\sqrt{x x }} \Rightarrow x x > 0 \Rightarrow x > 0$ $\Rightarrow D_f = \mathbb{R}^+$	الف) $y = \frac{x+1}{\sqrt{x+ x }} \Rightarrow x+ x > 0$ $\Rightarrow x > 0$ $\Rightarrow D_f = \mathbb{R}^+$	5

$$ب) y = \frac{1}{\sqrt{2-x}} \Rightarrow 2-x > 0 \Rightarrow$$

$$2 > x \Rightarrow 2 > x \Rightarrow D_f = (-\infty, 2)$$

مثلاً $1/9 = 0.111$ و $0.111 < 2$ پس این عدد در دامنه قرار می‌گیرد.

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

$$D_f = (-\infty, 2]$$

مثلاً $3 < 2$ پس 3 در دامنه قرار نمی‌گیرد.

$$ب) y = \frac{1}{\sqrt{-x[x]}} \Rightarrow -x[x] > 0$$

$$\Rightarrow \begin{matrix} \oplus & \times & \rightarrow & \ominus & \times & \oplus & = & \ominus \\ \ominus & \times & & & & & & \\ \ominus & \times & \rightarrow & \oplus & \times & \ominus & = & \ominus \end{matrix}$$

$$\Rightarrow D_f = \emptyset$$

$$الف) y = \frac{1}{x[x]} \Rightarrow x[x] \neq 0$$

$$\Rightarrow \begin{matrix} \oplus & \checkmark \\ \ominus & \times \\ \ominus & \checkmark \end{matrix} \Rightarrow \begin{matrix} \text{مثلاً } 1 \text{ یا } -1 \text{ در دامنه قرار نمی‌گیرد.} \\ \text{درست است که } 0 \text{ در دامنه قرار نمی‌گیرد.} \\ \text{مثلاً } 0.5 \text{ یا } -0.5 \text{ در دامنه قرار می‌گیرد.} \end{matrix}$$

$$D_f = [-1, 1]$$

$$ب) y = \sqrt{[x - \frac{1}{x}] + [-x + \frac{1}{x}]} \Rightarrow$$

$$\sqrt{[x - \frac{1}{x}] + [-(-x + \frac{1}{x})]} \Rightarrow \begin{cases} [a] + [a] = 0 \\ [a] + [-a] = -1 \end{cases}$$

$$\Rightarrow a \in \mathbb{Z} \Rightarrow x - \frac{1}{x} \in \mathbb{Z} \Rightarrow$$

$$\Rightarrow a \notin \mathbb{Z}$$

$$D_f = \{x \mid x = n + \frac{1}{x}, n \in \mathbb{Z}\}$$

$$الف) y = \sqrt{[x - \frac{1}{x}] + [x + \frac{1}{x}]} \Rightarrow$$

$$[x - \frac{1}{x}] + [x + \frac{1}{x}] \geq 0 \Rightarrow [x + \frac{1}{x}]$$

$$[x + \frac{1}{x} - 1] - 1 + [x + \frac{1}{x}] \geq 0 \Rightarrow$$

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

$$\Rightarrow x + \frac{1}{x} \geq 1 \Rightarrow x \geq \frac{1}{x} \Rightarrow$$

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

$$ب) y = \frac{\cot x + 1}{\tan x + 1} \Rightarrow \begin{matrix} \text{مثلاً } 0 \Rightarrow \infty \\ \text{مثلاً } 1 \Rightarrow 0 \end{matrix}$$

$$\tan x + 1 \neq 0 \Rightarrow \tan x \neq -1 \Rightarrow \begin{cases} 135^\circ \\ 315^\circ \end{cases}$$

$$\Rightarrow D_f = \mathbb{R} - \{2k\pi, 2k\pi + \frac{\pi}{2}, 2k\pi + \frac{3\pi}{2}, 2k\pi + \pi, 2k\pi + \frac{\pi}{4}, 2k\pi + \frac{5\pi}{4}\}$$

$$الف) y = \frac{1}{\sqrt{\sin^2 x - 1}} \Rightarrow$$

$$\sqrt{\sin^2 x - 1} \neq 0 \Rightarrow \sqrt{2} \sin x \neq 1 \Rightarrow$$

$$\sin x \neq \frac{1}{\sqrt{2}} \Rightarrow \frac{1}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

$$\Rightarrow \sin 45^\circ, \sin 135^\circ = \frac{\sqrt{2}}{2}$$

$$\Rightarrow D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{4}, 2k\pi + \frac{3\pi}{4}\}$$

$$ب) y = \sqrt{1 - 2\cos x} \Rightarrow 1 - 2\cos x \geq 0$$

$$\Rightarrow 1 \geq 2\cos x \Rightarrow \cos x \leq \frac{1}{2} \Rightarrow$$

مثلاً $\cos 120^\circ = -0.5$ و $-0.5 \leq 0.5$ پس این عدد در دامنه قرار می‌گیرد.

$$D_f = [2k\pi - \frac{\pi}{3}, 2k\pi - \frac{\pi}{3}] \cup [2k\pi + \frac{\pi}{3}, 2k\pi + \frac{\pi}{3}]$$

$$الف) y = \sqrt{2\sin x - 1} \Rightarrow 2\sin x \geq 1$$

$$\Rightarrow \sin x \geq \frac{1}{2} \Rightarrow$$

مثلاً $\sin 30^\circ = 0.5$ و $0.5 \geq 0.5$ پس این عدد در دامنه قرار می‌گیرد.

$$\Rightarrow D_f = [2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}]$$