

①

الف) $y = \sqrt{4-2x}$

$$\begin{aligned} 2-x \geq 0 &\rightarrow x \leq 2 \\ 4-\sqrt{2x} \geq 0 &\rightarrow \sqrt{2x} \leq 4 \rightarrow 2-x \leq 14 \rightarrow -12 \leq x \\ D_f &= [-12, 2] \end{aligned}$$

ب) $y = \sqrt{3-x-2}$

$$\begin{aligned} x-2 \geq 0 &\rightarrow 2 \leq x \\ 3-\sqrt{x-2} \geq 0 &\rightarrow \sqrt{x-2} \leq 3 \rightarrow x-2 \leq 9 \rightarrow x \leq 11 \\ D_f &= [2, 11] \end{aligned}$$

②

الف) $y = \sqrt{4-2x^2}$

$$\begin{aligned} 0 \leq 4-2x^2 &\rightarrow 2x^2 \leq 4 \rightarrow x^2 \leq 2 \rightarrow -\sqrt{2} \leq x \leq \sqrt{2} \\ D_f &= [-\sqrt{2}, +\sqrt{2}] \end{aligned}$$

ب) $y = \sqrt{3|x|-4}$

$$\begin{aligned} 0 \leq 3|x|-4 &\rightarrow 4 \leq 3|x| \rightarrow 3 \leq |x| \rightarrow \\ \begin{cases} 3 \leq x \\ x \leq -3 \end{cases} & D_f = (-\infty, -3] \cup [3, +\infty) \end{aligned}$$

③

الف) $y = \frac{\sqrt{|x|+1}}{\sqrt{|x|-3}}$

$$\begin{aligned} |x|-3 \neq 0 &\rightarrow |x| \neq 3 \\ x &\neq \pm 3 \end{aligned}$$

$$D_f = \mathbb{R} - \{\pm 3\}$$

ب) $y = \frac{\sqrt{x-1}}{\sqrt{x-9}}$

$$\begin{aligned} \sqrt{x-3} \neq 0 &\rightarrow \sqrt{x} \neq 3 \\ x &\neq 9 \end{aligned}$$

$$D_f = [0, +\infty) - \{9\}$$

④

الف) $y = \frac{\sqrt{3-|x|}}{|x|+2}$

$$0 \leq 3-|x| \rightarrow |x| \leq 3 \rightarrow -3 \leq x \leq 3$$

$$|x|+2 \neq 0 \rightarrow |x| \neq -2$$

منخرج عبارت همیشه
منفرجه میشود.

$$D_f = [-3, 3]$$

ب) $y = \frac{\sqrt{4-x^2}}{|x|-1}$

$0 \leq 4-x^2 \rightarrow x^2 \leq 4 \rightarrow -2 \leq x \leq 2$

$|x|-1 \neq 0 \rightarrow |x| \neq 1 \rightarrow x \neq \pm 1$

$D_f = [-2, 2] - \{+1, -1\}$

الف) $y = \frac{x+1}{\sqrt{x+|x|}}$ $x \in \mathbb{R}$

$x+|x| \begin{cases} \xrightarrow{\text{if}} x > 0 & x+x=2x \\ \xrightarrow{\text{if}} x < 0 & -x+x=0 \end{cases}$

خرج منفرد نشده

$D_f = \mathbb{R}^+ \text{ یا } (0, +\infty)$

ب) $y = \frac{1}{\sqrt{x|x|}}$

$x|x| \begin{cases} \xrightarrow{\text{if}} x > 0 & x^2 \\ \xrightarrow{\text{if}} x < 0 & -x^2 \end{cases}$

$\frac{1}{\pm x^2}$

$D_f = \mathbb{R}^+ \text{ یا } (0, +\infty)$

الف) $y = \sqrt{2-[x]} \rightarrow 0 \leq 2-[x] \rightarrow [x] \leq 2 \quad D_f = (-\infty, 3)$

ب) $y = \frac{1}{\sqrt{2-[x]}}$ $0 \leq 2-[x] \rightarrow [x] \leq 2 \quad D_f = (-\infty, 3)$

الف) $y = \frac{1}{x[x]}$ $x[x] \neq 0 \xrightarrow{\text{if}} \begin{cases} x=0 \\ [x]=0, 1, 2, \dots \end{cases} \Rightarrow x[x] \neq 0$

$D_f = \mathbb{R} - [0, 1)$

ب) $y = \frac{1}{\sqrt{-x[x]}}$

$-x[x] \begin{cases} \xrightarrow{x > 0} -x \times x = \text{بسیار منفی} \\ \xrightarrow{x = 0} \text{تعریف نشده} \\ \xrightarrow{x < 0} +x \times -x = \text{بسیار منفی} \end{cases}$

$D_f = \emptyset$

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الف) $x = \sqrt{[x - \frac{1}{3}] + [x + \frac{2}{3}]} \rightarrow \sqrt{[x - \frac{1}{3}] + 1 + [x + \frac{2}{3}]} \rightarrow [x + \frac{2}{3}] + [x + \frac{2}{3}] - 1 \geq 0$

$\text{Parsian } 2[x + \frac{2}{3}] \geq 1 \rightarrow [x + \frac{2}{3}] \geq \frac{1}{2} \rightarrow x + \frac{2}{3} \geq 1 \rightarrow x \geq \frac{1}{3}$

$D_f = [\frac{1}{3}, +\infty)$

ب) $\left\{ \left[x - \frac{1}{3} \right] + \left[-x + \frac{1}{3} \right] \rightarrow \left[x - \frac{1}{3} \right] + \left[-(x - \frac{1}{3}) \right] \right\} \geq 0$

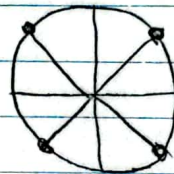
نکته: $\begin{cases} \rightarrow [a] + [-a] = 0 \xrightarrow{\text{if}} a \in \mathbb{Z} \\ \rightarrow [a] + [-a] = -1 \xrightarrow{\text{if}} a \notin \mathbb{Z} \end{cases}$

از انتخابی که ما می‌خواهیم زیر را دیدیم: $x - \frac{1}{3} \in \mathbb{Z}$ منفر شود پس

$$x - \frac{1}{3} \in \mathbb{Z} \rightarrow D_f = \left\{ x \mid x = k + \frac{1}{3}, k \in \mathbb{Z} \right\}$$

الف) $y = \frac{1}{2 \sin^2 x - 1} \rightarrow 2 \sin^2 x - 1 \neq 0 \rightarrow \sin^2 x \neq \frac{1}{2} \rightarrow \sin x \neq \pm \frac{1}{\sqrt{2}}$ (9)

$$\sin x \neq \pm \frac{\sqrt{2}}{2}$$

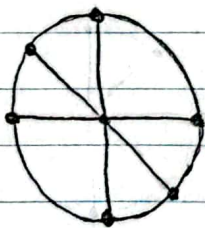


$$D_f = \mathbb{R} - \left\{ k\pi + \frac{\pi}{4}, k\pi + \frac{3\pi}{4} \right\}$$

ب) $y = \frac{\cot x + 1}{\tan x + 1}$

$$\frac{\frac{\cos x}{\sin x} + 1}{\frac{\sin x}{\cos x} + 1}$$

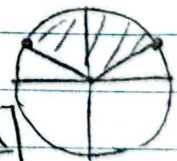
$$= \begin{cases} \sin x \neq 0 \\ \cos x \neq 0 \\ \frac{\sin x}{\cos x} \neq -1 \rightarrow \sin x \neq -\cos x \end{cases}$$



$$D_f = \mathbb{R} - \left\{ \frac{k\pi}{2}, k\pi - \frac{\pi}{4} \right\}$$

الف) $y = \sqrt{2 \sin x - 1} \Rightarrow 2 \sin x - 1 \geq 0 \rightarrow \sin x \geq \frac{1}{2}$ (10)

$$D_f = \left[2k\pi + \frac{\pi}{6}, 2k\pi + \pi - \frac{\pi}{6} \right]$$



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

$$D_f = \left[2k\pi + \frac{\pi}{3}, 2k\pi + \frac{5\pi}{3} \right]$$

$$D_f = \mathbb{R} - \left[2k\pi + \frac{\pi}{3}, 2k\pi + \frac{5\pi}{3} \right]$$

