

الف) $y = \sqrt{\frac{x^2 - 2x}{x^3 - x}} \geq 0$

$x^2 - 2x \rightarrow x(x-2)$
 $x^3 - x \geq 0 \rightarrow x(x^2 - 1) \geq 0 \rightarrow x(x-1)(x+1) \geq 0$

ب) $\frac{x^4 - x^3}{x^3 - x} \geq 0 \Rightarrow x^3(x-1) = x^3(x+1)(x-1)$

جدول علامت:

-1	0	1	2
+	-	+	+

$D_f = (-1, 0) \cup (0, 1) \cup [2, +\infty)$

جدول علامت:

-1	0	1
+	+	+

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

بار = مفاد

الف) $\frac{x+1}{\sqrt{x+|x|}} > 0$

$x+|x| > 0 \rightarrow |x| > -x$
 درستی هارمونیک
 سن (ن) است

ب) $\sqrt{x|x|} > 0$

$x|x| > 0$
 منفرد شود پس چیست
 منفی هارمونیک سن

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

بار = مفاد

الف) $y = \sqrt{2 - [x]} \geq 0$

$2 - [x] \geq 0$
 $[x] \leq 2$
 $x < 3$ (خرد نمی‌شود)

ب) $y = \frac{1}{\sqrt{2 - [x]}} \geq 0$

$2 - [x] > 0$
 $[x] < 2$
 $x < 2$ (برکت خرد می‌شود)

$D_f = (-\infty, 3)$

$D_f = (-\infty, 2)$ (نمی‌خواهیم)

بار = مفاد

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

$[x - \frac{1}{3}] + [x + \frac{2}{3}] \geq 0$
 $[x - 1 + \frac{2}{3}] + [x + \frac{2}{3}] \geq 0$
 $[x + \frac{2}{3}] - 1 + [x + \frac{2}{3}] \geq 0$
 $2[x + \frac{2}{3}] \geq 1 \Rightarrow [x + \frac{2}{3}] \geq \frac{1}{2}$

ب) $y = \sqrt{[x - \frac{1}{3}] + [-x + \frac{1}{3}]} \geq 0$

$[x - \frac{1}{3}] + [-x + \frac{1}{3}] \geq 0 \Rightarrow [-(x - \frac{1}{3})]$

کدام $\begin{cases} a \in \mathbb{Z} \rightarrow [a] + [-a] = 0 \Rightarrow x - \frac{1}{3} \in \mathbb{Z} \Rightarrow x \in \mathbb{Z} + \frac{1}{3} \\ a \notin \mathbb{Z} \rightarrow [a] + [-a] = -1 \end{cases}$

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

بار = مفاد

الف) $y = \frac{2}{\sin^2 x - 1} \neq 0$

$\sin^2 x - 1 \neq 0 \Rightarrow \sin x \neq \pm 1$

ب) $y = \frac{3}{\sin^2 x - 1} \neq 0$

$\sin^2 x \neq 1 \Rightarrow \sin x \neq \pm \frac{1}{\sqrt{2}}$

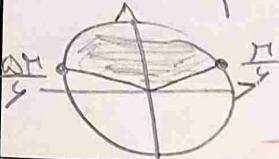
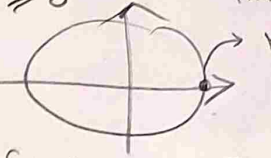
$\sin x \neq \pm \frac{1}{\sqrt{2}} \Rightarrow \sin x \neq \pm \frac{\sqrt{2}}{2}$

$D_f = \mathbb{R} - \{x \mid x = \frac{\pi}{4} + \frac{n\pi}{2}\}$

نقطه بر روی دایره

بار = مفاد

زهراسات حل امانی

الف) $y = \sqrt{2 \sin x - 1} \geq 0$ $2 \sin x - 1 \geq 0 \Rightarrow 2 \sin x \geq 1$ $\sin x \geq \frac{1}{2}$  $D_f = [\frac{\pi}{6}, \frac{5\pi}{6}]$	ب) $y = \sqrt{\cos x - 1} \geq 0$ $\cos x \geq 1$ $\cos x$ از 1 بزرگتر نمی شود.  $D_f = \{x x = 2k\pi\}$ $k \in \mathbb{Z}$
الف) $\cos y = x - 3$ $\cos y \Rightarrow [-1, 1]$ $-1 \leq x - 3 \leq 1$ $2 \leq x \leq 4$ $2 \leq x \leq 4$ $-4 \leq x \leq -2$ $D_f = [2, 4] \cup [-4, -2]$	ب) $y = \arcsin(x^2 + 3x + 1)$ $\arcsin \Rightarrow [-1, 1]$ $-1 \leq x^2 + 3x + 1 \leq 1$ $x^2 + 3x + 2 \geq 0$ $(x+1)(x+2) \geq 0$ $x \leq -2$ or $x \geq -1$ $D_f = (-\infty, -2] \cup [-1, +\infty)$
الف) $y = \sqrt{2 - \log_3(x-2)} \geq 0$ $x-2 > 0 \Rightarrow x > 2$ $2 - \log_3(x-2) \geq 0$ $\log_3(x-2) \leq 2$ $x-2 \leq 9$ $x \leq 11$ $D_f = (2, 11]$	ب) $y = \log(x^2 - x)$ $x^2 - x > 0 \Rightarrow x(x-1) > 0$ $x < 0$ or $x > 1$ $D_f = (-\infty, 0) \cup (1, +\infty)$
الف) $y = \frac{3}{e^x + 1} \neq 0$ $e^x \neq -1$ ✓ $D_f = \mathbb{R}$	ب) $y = \frac{3}{e^x - 1} \neq 0$ $e^x \neq 1 \Rightarrow e^x \neq e^0 \Rightarrow x \neq 0$ $D_f = \mathbb{R} - \{0\}$ ج) $y = \frac{3}{e^x - 2} \neq 0$ $e^x \neq 2 \Rightarrow e^x \neq e^{\log_e 2} \Rightarrow x \neq \log_e 2$ $D_f = \mathbb{R} - \{\log_e 2\}$
الف) $y = (x+1)!$ $x+1 \in \mathbb{W} \Rightarrow x \in \mathbb{W} - 1 \Rightarrow x \in \frac{\mathbb{W}-1}{\varepsilon}$ $D_f = \{x x = \frac{k-1}{\varepsilon}, k \in \mathbb{W}\}$	ب) $y = \left(\frac{3x-2}{x-4}\right)!$ $\frac{3x-2}{x-4} \in \mathbb{W}$ $\frac{ax+b}{cx+d} = y \Rightarrow x = -\frac{ay-b}{cy-d}$ $x = -\frac{-a\mathbb{W}+2}{3\mathbb{W}-4} = x = \frac{a\mathbb{W}-2}{3\mathbb{W}-4}$ $D_f = \{x x = \frac{a k-2}{3 k-4}, k \in \mathbb{W}\}$