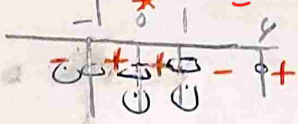


الف) $y = \sqrt{\frac{x^2 - 2x}{x^3 - x}} \geq 0$

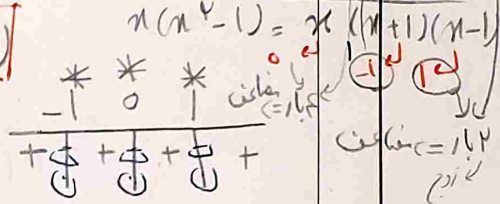
$x^2 - 2x \rightarrow x(x-2)$
 $x^3 - x \geq 0 \rightarrow x(x^2 - 1) \geq 0$
 $x(x-1)(x+1) \geq 0$



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

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

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



الف) $\frac{x+1}{\sqrt{x+|x|}} > 0$
 $x+|x| > 0 \rightarrow |x| > -x$
 $x > -|x|$
 $D_f = \mathbb{R}^+ \cup (0, +\infty)$

ب) $\sqrt{x|x|} > 0$
 $x|x| > 0$
 $D_f = \mathbb{R}^+ \cup D_f = (0, +\infty)$

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

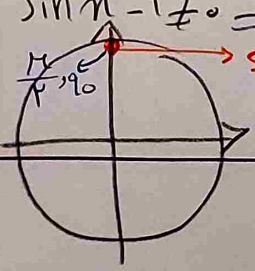
ب) $y = \frac{1}{\sqrt{2 - [x]}} \geq 0$
 $2 - [x] > 0$
 $[x] < 2$
 $x < 2$
 $D_f = (-\infty, 2)$

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

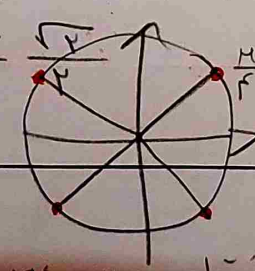
ب) $y = \sqrt{[x - \frac{1}{3}] + [-x + \frac{1}{3}]} \geq 0$
 $[x - \frac{1}{3}] + [-x + \frac{1}{3}] \geq 0 \Rightarrow [-(x - \frac{1}{3})]$
 $\begin{cases} a \in \mathbb{Z} \rightarrow [a] + [-a] = 0 \Rightarrow x - \frac{1}{3} \in \mathbb{Z} \Rightarrow x \in \mathbb{Z} + \frac{1}{3} \\ a \notin \mathbb{Z} \rightarrow [a] + [-a] = -1 \end{cases}$
 $D_f = \{x \mid x = k + \frac{1}{3}, k \in \mathbb{Z}\}$

$x + \frac{2}{3} \geq 1 \Rightarrow x \geq \frac{1}{3} \Rightarrow D_f = [\frac{1}{3}, +\infty)$

الف) $y = \frac{2}{\sin^2 x - 1} \neq 0$
 $\sin^2 x - 1 \neq 0 \Rightarrow \sin x \neq \pm 1$
 $D_f = \mathbb{R} - \{x \mid x = \frac{\pi}{2} + \frac{\pi}{2}\}$

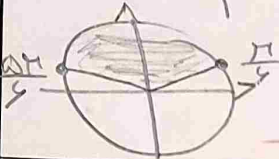
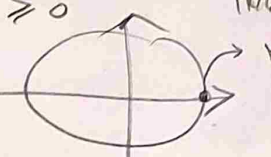


ب) $y = \frac{3}{\sin^2 x - 1} \neq 0$
 $\sin^2 x \neq \frac{1}{3} \Rightarrow \sin x \neq \pm \frac{1}{\sqrt{3}}$
 $D_f = \mathbb{R} - \{x \mid x = \frac{\pi}{3} + \frac{\pi}{2}\}$



نقطه برهم = ۳

زهراسانات حل امانی

الف) $y = \sqrt{2 \sin x - 1} \geq 0$ $2 \sin x - 1 \geq 0 \Rightarrow 2 \sin x \geq 1$ $\sin x \geq \frac{1}{2}$  $D_f = [2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}]$	ب) $y = \sqrt{\cos x - 1} \geq 0$ $\cos x \geq 1$ از اینترتین شود  $D_f = \{x x = 2k\pi\}$ $k \in \mathbb{Z}$
الف) $\cos y = n - 3$ $\cos y \in [-1, 1]$ $-1 \leq n - 3 \leq 1$ $2 \leq n \leq 4$ $2 \leq n \leq 4$ $-4 \leq n \leq -2$ $D_f = [2, 4] \cup [-4, -2]$	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) $y = \frac{3}{e^x - 1} \neq 0$ $e^x \neq 1 \Rightarrow x \neq 0$ $D_f = \mathbb{R} - \{0\}$ ج) $y = \frac{3}{e^x - 2} \neq 0$ $e^x \neq 2 \Rightarrow x \neq \log_2 2 = 1$ $D_f = \mathbb{R} - \{1\}$
الف) $y = (x+1)!$ $x+1 \in \mathbb{W} \Rightarrow x \in \mathbb{W} - 1$ $D_f = \{x x = k-1, k \in \mathbb{W}\}$	ب) $y = \left(\frac{x-2}{x-4}\right)!$ $\frac{x-2}{x-4} \in \mathbb{W}$ $\frac{ax+b}{cx+d} = y \Rightarrow x = -\frac{ay+b}{cy+d}$ $x = -\frac{a\mathbb{W}+b}{c\mathbb{W}+d} = x = \frac{a\mathbb{W}-2}{c\mathbb{W}-4}$ $D_f = \{x x = \frac{a\mathbb{W}-2}{c\mathbb{W}-4}, k \in \mathbb{W}\}$