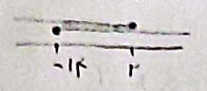
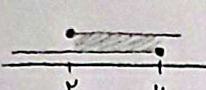


الف) $y = \sqrt{4 - \sqrt{1-x}}$ $4 - \sqrt{1-x} \geq 0 \Rightarrow 4 \geq \sqrt{1-x} \Rightarrow 1-x \leq 16 \Rightarrow -14 \leq x$
 $1-x \geq 0 \Rightarrow x \leq 1$
 $D_f = [-14, 1]$



ب) $y = \sqrt{3 - \sqrt{x-2}}$ $3 - \sqrt{x-2} \geq 0 \Rightarrow 3 \geq \sqrt{x-2} \Rightarrow 9 \geq x-2 \Rightarrow x \leq 11$
 $x-2 \geq 0 \Rightarrow x \geq 2$
 $D_f = [2, 11]$



الف) $y = \sqrt{4 - 2x^2}$ $4 - 2x^2 \geq 0 \Rightarrow (2 - \sqrt{2}x)(2 + \sqrt{2}x) \geq 0$
 $2 - \sqrt{2}x = 0 \Rightarrow x = \frac{2}{\sqrt{2}} = \sqrt{2}$
 $2 + \sqrt{2}x = 0 \Rightarrow x = -\sqrt{2}$
 $D_f = [-\sqrt{2}, \sqrt{2}]$

ب) $y = \sqrt{3|x| - 9}$ $3|x| - 9 \geq 0 \Rightarrow |x| - 3 \geq 0 \Rightarrow |x| \geq 3 \Rightarrow x \geq 3 \cup x \leq -3$
 $D_f = (-\infty, -3] \cup [3, +\infty)$

الف) $y = \sqrt[3]{\frac{|x|+1}{|x|-3}}$ $|x|-3 \neq 0 \Rightarrow |x| \neq 3 \Rightarrow x \neq \pm 3$
 $D_f = \mathbb{R} - \{-3, 3\}$

ب) $y = \sqrt[3]{\frac{\sqrt{x+1}}{\sqrt{x-3}}}$ $\sqrt{x-3} \neq 0 \Rightarrow x-3 \neq 0 \Rightarrow x \neq 3$
 $x \geq 0$
 $D_f = [0, +\infty) - \{3\}$

الف) $y = \frac{\sqrt{3-|x|}}{|x|+2}$ $3-|x| \geq 0 \Rightarrow |x| \leq 3 \Rightarrow -3 \leq x \leq 3$
 $|x|+2 \neq 0$ همیشه درست است
 $D_f = [-3, 3]$

ب) $y = \frac{\sqrt{4-x^2}}{|x|-1}$ $4-x^2 \geq 0 \Rightarrow (2-x)(2+x) \geq 0$
 $2-x \geq 0 \Rightarrow x \leq 2$
 $2+x \geq 0 \Rightarrow x \geq -2$
 $|x|-1 \neq 0 \Rightarrow |x| \neq 1 \Rightarrow x \neq \pm 1$
 $D_f = [-2, 2] - \{-1, 1\}$

الف) $y = \frac{x+1}{\sqrt{x+|x|}}$ $x+|x| \geq 0$
 $x=+ \checkmark x+x=2x \checkmark$
 $x=- X x+(-x)=0X$
 $x=0 X 0+0=0X$
 $D_f = (0, +\infty)$

ب) $y = \frac{1}{\sqrt{x|x|}}$ $x|x| \geq 0$
 $x=+ \checkmark x \times x = x^2 \checkmark$
 $x=- X x(-x) = -x^2 X$
 $x=0 X 0 \times 0 = 0X$
 $D_f = (0, +\infty)$

الف) $y = \sqrt{1-x}$ $1-x \geq 0 \Rightarrow x \leq 1$ if $1 < x < 2$ $y=0$

$D(f) = [1, -\infty)$

ب) $y = \frac{1}{\sqrt{1-x}}$

$1-x > 0 \Rightarrow x < 1$

شماره ۰ باید باشد
مساوی ندارد

$1 < x < 2$
ریشه های خارج

$D(f) = (1, -\infty)$

الف) $y = \frac{1}{x[x]}$

$x[x] \neq 0 \Rightarrow x \notin [0, 1)$

$D(f) = \mathbb{R} - [0, 1)$

ب) $y = \frac{1}{\sqrt{-x[x]}}$

$-x[x] > 0 \xrightarrow{x-1} x[x] < 0 \Rightarrow D(f) = \emptyset$

x و $[x]$ هماره علامت اند
و حاصل ضربشان هماره نامنفی است

حاصل ضرب وقتی منفی است که $x \in [0, 1)$ باشد در این سوال
نباید صفر شود چون فرجه نباید شود

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

$[x - \frac{1}{x}] + [x + \frac{1}{x}] \geq 0 \Rightarrow [x - \frac{1}{x}] + 1 + [x + \frac{1}{x}] - 1 \geq 0 \Rightarrow [x - \frac{1}{x} + 1] + [x + \frac{1}{x} - 1] \geq 0$
جزء صحیح را داخل پرانتز می نینیم
طرف چپ را +1 می کنیم و سپس -1

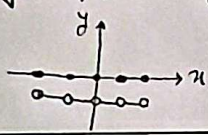
$\Rightarrow [x + \frac{1}{x}] + [x + \frac{1}{x}] - 1 \geq 0 \Rightarrow 2[x + \frac{1}{x}] \geq 1 \Rightarrow [x + \frac{1}{x}] \geq \frac{1}{2} \Rightarrow [x + \frac{1}{x}] \geq 1 \Rightarrow 1 \leq x + \frac{1}{x} \Rightarrow \frac{1}{x} \leq x - 1$

$\Rightarrow D(f) = [\frac{1}{2}, +\infty)$

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

$\begin{cases} a \in \mathbb{Z} & [a] + [-a] = 0 \\ a \notin \mathbb{Z} & [a] + [-a] = -1 \end{cases}$

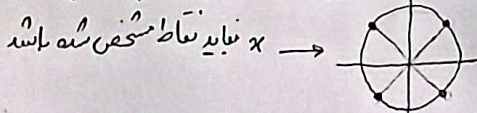
$\Rightarrow D(f) = \{x \mid x = k + \frac{1}{x}, k \in \mathbb{Z}\}$



$\begin{cases} x \in \mathbb{Z} & y = 0 \\ x \notin \mathbb{Z} & y = -1 \end{cases}$

الف) $y = \frac{1}{r \sin^2 x - 1}$

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



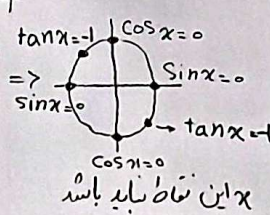
$D(f) = \mathbb{R} - \{k\pi \pm \frac{\pi}{r}\}$

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

$\cot x = \frac{\cos x}{\sin x} \Rightarrow \sin x \neq 0$

$\tan x = \frac{\sin x}{\cos x} = x \cos x \neq 0$

$\tan x + 1 \neq 0 \Rightarrow \tan x \neq -1$



$D(f) = \mathbb{R} - \{k\pi, k\pi + \frac{\pi}{2}, k\pi - \frac{\pi}{2}\}$

الف) $y = \sqrt{r \sin x - 1}$

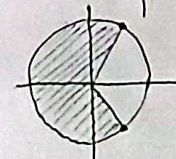
$r \sin x - 1 \geq 0 \Rightarrow r \sin x \geq 1 \Rightarrow \sin x \geq \frac{1}{r}$



$D(f) = [r k \pi + \frac{\pi}{r}, r k \pi + \frac{\pi}{r}]$

ب) $y = \sqrt{1 - r \cos x}$

$1 - r \cos x \geq 0 \Rightarrow r \cos x \leq 1 \Rightarrow \cos x \leq \frac{1}{r}$



$D(f) = [r k \pi + \frac{\pi}{r}, r k \pi - \frac{\pi}{r}]$