

الف) $y = \sqrt{\frac{x^2-4x}{x^3-x}} \geq 0 \rightarrow \frac{x^2-4x}{x^3-x} \geq 0 \rightarrow \frac{x(x-4)}{x(x^2-1)} \geq 0$ 1/1, 1/2

-1	0	1	4
+	-	+	-

$D_f = (-\infty, -1) \cup (0, 1) \cup [4, +\infty)$ -1

ب) $y = \sqrt{\frac{x^3-x^2}{x^3-x}} \geq 0 \rightarrow \frac{x^3-x^2}{x^3-x} \geq 0 \rightarrow \frac{x^2(x-1)}{x(x^2-1)} \geq 0$ 1/1, 1/2

-1	0	1
+	+	+

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

الف) $y = \frac{x+1}{\sqrt{x+|x|}} \rightarrow x+|x| > 0 \rightarrow x > -x \rightarrow x > 0$ -2

$D_f = (0, +\infty)$

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

$D_f = (0, +\infty)$

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

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

الف) $y = \sqrt{[x-\frac{1}{p}] + [x+\frac{p}{p}]} \rightarrow [x-\frac{1}{p}] + [x+\frac{p}{p}] \geq 0 \rightarrow [x+\frac{p}{p}-1] + [x+\frac{p}{p}] \geq 0$ -4

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

$x+\frac{p}{p} \geq 1 \rightarrow D_f = [\frac{1}{p}, +\infty)$

ب) $y = \sqrt{[x-\frac{1}{p}] + [-x+\frac{1}{p}]} \geq 0 \rightarrow [x-\frac{1}{p}] + [-(x-\frac{1}{p})] \geq 0 \rightarrow \begin{cases} n \in \mathbb{Z} & [n] + [-n] = 0 \\ n \notin \mathbb{Z} & [n] + [-n] = -1 \end{cases}$

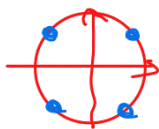
$x-\frac{1}{p} \in \mathbb{Z} \rightarrow \{x \mid x = k + \frac{1}{p}, k \in \mathbb{Z}\}$

الف) $y = \frac{p}{\sin x - 1} \neq 0 \rightarrow \sin x \neq 1$



$D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{2}\}$ -a

ب) $y = \frac{p}{p \sin^2 x - 1} \neq 0 \rightarrow p \sin^2 x \neq 1 \rightarrow \sin^2 x \neq \frac{1}{p} \rightarrow \sin x \neq \pm \frac{1}{\sqrt{p}} = \pm \frac{\sqrt{p}}{p}$



$D_f = \mathbb{R} - \{k\pi \pm \frac{\pi}{\sqrt{p}}\}$

ل.د

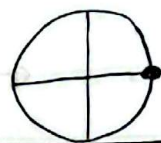
الف) $\sqrt{p \sin x - 1} \geq 0 \rightarrow p \sin x \geq 1 \rightarrow \sin x \geq \frac{1}{p}$



$D_f = [2k\pi + \frac{\pi}{p}, 2k\pi + \frac{\pi}{2}]$

ل.د ✓

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



$D_f = 2k\pi$

الف) $\cos y = |x| - 3 \rightarrow -1 \leq |x| - 3 \leq 1 \rightarrow p \leq |x| \leq f$

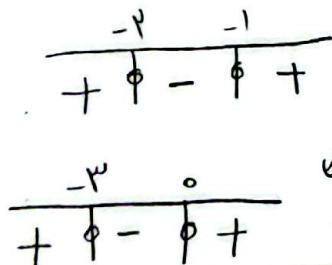
$\begin{cases} -f \leq x \leq -p \\ p \leq x \leq f \end{cases}$ -v

$D_f = [-f, -p] \cup [p, f]$

✓

ب) $y = \arcsin(x^p + 3x + 1) \rightarrow -1 \leq x^p + 3x + 1 \leq 1 \rightarrow \begin{cases} x^p + 3x + 1 \geq -1 \rightarrow x^p + 3x + 2 \geq 0 \\ x^p + 3x + 1 \leq 1 \rightarrow x^p + 3x \leq 0 \end{cases}$

$(x+1)(x+2) \geq 0$
 $x(x+3) \leq 0$



ل.د

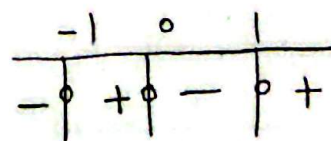
$D_f = (-\infty, -2] \cup [0, +\infty)$
 $[-3, -2] \cup [-1, 0]$

الف) $y = \sqrt{p - \log_p(x-2)} \rightarrow x-2 > 0 \rightarrow x > 2$

$p - \log_p(x-2) \geq 0 \rightarrow \log_p(x-2) \leq p \rightarrow x-2 \leq p \rightarrow x \leq p+2$

$D_f = (2, p+2]$

ب) $y = \log(x^3 - x) \rightarrow x^3 - x > 0 \rightarrow x(x^2 - 1) > 0$



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

ل.د ✓

$$\text{الف) } y = \frac{1}{f^x + 1} \rightarrow f^x \neq -1 \quad D_f = \mathbb{R}$$

$$\text{ب) } y = \frac{1}{f^x - 1} \rightarrow f^x \neq 1 \rightarrow x \neq 0 \quad D_f = \mathbb{R} - \{0\}$$

$$\text{ج) } y = \frac{1}{f^x - 2} \rightarrow f^x \neq 2 \quad D_f = \mathbb{R} - \{\log_f 2\}$$

✓

$$\text{د) } y = \frac{1}{f^x - 3} \rightarrow f^x \neq 3 \quad D_f = \mathbb{R} - \{\log_f 3\}$$

$$\text{الف) } y = (fx + 1)! \rightarrow fx + 1 \in \mathbb{W} \rightarrow fx \in \mathbb{W} - 1 \rightarrow x = \frac{\mathbb{W} - 1}{f}$$

-10

$$\{x \mid x = \frac{k-1}{f}, k \in \mathbb{W}\}$$

1, 10 ✓

$$\text{ب) } y = \left(\frac{fx - 1}{fx - 2} \right)! \rightarrow \frac{fx - 1}{fx - 2} \in \mathbb{W} \rightarrow \frac{+ \mathbb{W} + 1}{+ \mathbb{W} - 2} \rightarrow$$

$$\{x \mid x = \frac{+ \mathbb{W} + 1}{+ \mathbb{W} - 2}, k \in \mathbb{W}\}$$