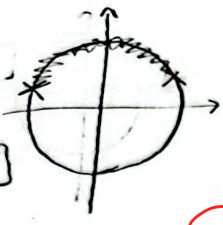
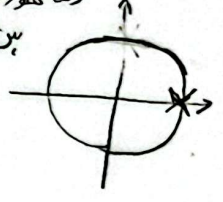


الف) $\frac{x^2-4x}{x^2-x} \geq 0 \rightarrow x(x-4) \geq 0$ $\frac{x^2-4x}{x^2-x} \rightarrow x(x-1)$ $f(x) = 0^*, 4, \pm 1$ $\begin{array}{c c c c c} -1 & 0 & 1 & 4 & \\ \hline + & - & + & - & + \end{array}$ $D_f: (-1, 1) \cup (4, +\infty) - \{0\}$	ب) $\frac{x^3-x^2}{x^2-x} \geq 0 \rightarrow x^2(x-1) \geq 0$ $\frac{x^3-x^2}{x^2-x} \rightarrow x(x-1)$ $f(x) = 0, \pm 1^*$ $\begin{array}{c c c c} -1 & 0 & 1 & \\ \hline + & - & + & + \end{array}$ $D_f = \mathbb{R} - \{0, \pm 1\}$	1
الف) $D_f = \mathbb{R}^+$ الف) $D_f = \mathbb{R}^+$ الف) $D_f = \mathbb{R}^+$	ب) $D_f = \mathbb{R}^+$ ب) $D_f = \mathbb{R}^+$ ب) $D_f = \mathbb{R}^+$	2
الف) $2 - [x] \geq 0$ $[x] \leq 2$ $D_f: (-\infty, 3)$	ب) $2 - [x] > 0$ $[x] < 2$ $D_f = (-\infty, 2)$	3
الف) $[x - \frac{1}{p}] + [x + \frac{1}{p}] \geq 0 \Rightarrow$ $[x - \frac{1}{p}] - 1 + [x + \frac{1}{p}] \geq 0 \Rightarrow [x + \frac{1}{p}] \geq \frac{1}{p}$ $\Rightarrow x + \frac{1}{p} \geq 1 \Rightarrow x \geq \frac{1}{p}$ $D_f = [\frac{1}{p}, +\infty)$	ب) $[x - \frac{1}{p}] + [x + \frac{1}{p}] \geq 0 \Rightarrow [a] + [-a] = 0$ $[a] + [-a] = -1$ $x - \frac{1}{p} \in \mathbb{Z} \Rightarrow D_f$ $D_f = \{x x = k + \frac{1}{p}, k \in \mathbb{Z}\}$	4
الف) $\sin x \neq 1$ $D_f: \mathbb{R} - \{2k\pi + \frac{\pi}{2}\}$	ب) $\sin x \neq 1 \Rightarrow \sin x \neq \pm \frac{\sqrt{2}}{2}$ $D_f = \mathbb{R} - \{\frac{k\pi}{2} + \frac{\pi}{4}\}$	5

الف) $2 \sin x - 1 \geq 0 \Rightarrow \sin x \geq \frac{1}{2}$ ب) $\cos x \geq 1$ $-1, 1 \leq \cos x \leq 1$

$D_f = \left[2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6} \right]$ $D_f = \{2k\pi\}$

(2) ✓

الف) $-1 \leq |x| - 2 \leq 1$ ب) $-1 \leq x^2 + 2x + 1 \leq 1$

$2 \leq |x| \leq 3 \Rightarrow 2 \leq x \leq 3$
 $-3 \leq x \leq -2$

$D_f = [2, 3] \cup [-3, -2]$

$-1 \leq x^2 + 2x + 1 \leq 1 \Rightarrow x^2 + 2x \leq 0 \Rightarrow x(x+2) \leq 0$

$\frac{-2}{-1} \quad \frac{0}{0}$ $\frac{-2}{-1} \quad \frac{0}{0}$

$D_f = [-2, 0] \cup [0, 2]$

(2) ✓

الف) $x - 2 > 0 \Rightarrow x > 2$ ب) $x(x^2 - 1) > 0$

$2 - \log_2(x-2) > 0 \Rightarrow \log_2(x-2) < 2$

$\Rightarrow x - 2 < 4 \Rightarrow x < 6$

$D_f = (2, 6]$

$f(x) = 0 \Rightarrow x = -1, 0, 1$

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

(2) ✓

الف) $\mathbb{R}$ ب) $\varepsilon^x \neq 1$ $D_f = \mathbb{R} - \{0\}$

2) $\varepsilon^x \neq 2$ $D_f = \mathbb{R} - \{\log_\varepsilon 2\}$

3) $\varepsilon^x \neq 3$ $D_f = \mathbb{R} - \{\log_\varepsilon 3\}$

(2) ✓

الف) $\varepsilon x + 1 \in \mathbb{W} \Rightarrow x \in \frac{\mathbb{W} - 1}{\varepsilon}$ ب) $\frac{x^2 - 2}{x - 2} \in \mathbb{W} \Rightarrow x^2 - 2 \in \mathbb{W}(x - 2)$

$D_f = \left\{ x \mid x = \frac{k-1}{\varepsilon}, k \in \mathbb{W} \right\}$

$\Rightarrow x(2 - x) \in \mathbb{W} \Rightarrow x = \frac{-2 \pm \sqrt{4 + 4\mathbb{W}}}{-2} = \frac{-2 \pm 2\sqrt{1 + \mathbb{W}}}{-2} = 1 \pm \sqrt{1 + \mathbb{W}}$

$\Rightarrow D_f = \left\{ x \mid x = \frac{2 - 4k}{2 - 2k}, k \in \mathbb{W} \right\}$

(2) ✓