

الف) $\frac{x(x-4) \rightarrow 4}{1 \leq x-1 \leq x+1 \rightarrow -1} \geq 0$ $\frac{-1}{-1} + \frac{1}{1} + \frac{4}{-1} = -4$ $(-1, 4) \cup [4, +\infty)$
 $x \neq 0$

ب) $\frac{x^2 x^2 (x-1)(x+1)}{x^2 (x-1)} \geq 0$ $x^2 (x+1) \geq 0$ $x+1 \geq 0$ $D_f = [-1, +\infty) - \{0\}$
 $x \geq -1$
 $x^2 (x-1) \rightarrow x=0$ غ، $x=1$ غ

الف) $x + |x| > 0$ $|x| > -x$ $D_f = (-\infty, 0)$

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

الف) $[x] \leq 2 \rightarrow x < 3 \rightarrow D_f = (-\infty, 3)$

ب) $[x] < 2$ $x < 2 \rightarrow D_f = (-\infty, 2)$

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

ب) $\text{if } \begin{cases} a \in \mathbb{Z} & [a] + [-a] = 0 \\ a \notin \mathbb{Z} & [a] + [-a] = -1 \end{cases} \rightarrow x - \frac{1}{x} \in \mathbb{Z}$ $D_f = \{x \mid x = k + \frac{1}{x}\}$

الف) $\sin x \neq 1$ $D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{2}\}$

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

$D_f = \mathbb{R} - \{\frac{n\pi}{2} + \frac{k\pi}{\sqrt{2}} \mid k \in \mathbb{Z}\}$

الف) $2\sin x \geq 1 \quad \sin x \geq \frac{1}{2} \quad D_f = \left[\frac{\pi}{6} + 2k\pi, \frac{5\pi}{6} + 2k\pi\right]$

ب) $\cos x \geq 1 \quad D_f \rightarrow R = \{2k\pi\}$

الف) $-1 \leq |x-2| < 1$ $\frac{2}{3} \leq x \leq \frac{4}{3}$ $D_f = R[-\frac{4}{3}, -\frac{2}{3}] \cup [\frac{2}{3}, \frac{4}{3}]$

ب) $-1 \leq x^2 + 2x + 1 \leq 1$

$D_f \rightarrow R = [-1, -2] \cup [-1, 0]$

1) $x^2 + 2x + 1 \geq -1 \rightarrow x^2 + 2x + 2 \geq 0 \rightarrow (x+1)(x+2) \rightarrow D_f \rightarrow R(-\infty, -2] \cup [-1, +\infty)$

2) $x^2 + 2x + 1 \leq 1 \rightarrow x^2 + 2x \leq 0 \rightarrow x(x+2) \leq 0 \rightarrow D_f \rightarrow R[-2, 0]$

الف) $x-2 > 0 \rightarrow x > 2$

$\cap D_f = (2, 11]$

$2 - \log_2 \frac{x-2}{x} \geq 0 \rightarrow \log_2 \frac{x-2}{x} \leq 2 \rightarrow x-2 \leq 4 \rightarrow x \leq 11$

ب) $x(x^2-1) > 0 \rightarrow x(x-1)(x+1) > 0 \quad D_f = (-1, 0) \cup (1, +\infty)$

الف) $x_{n+1} \neq 0 \quad x_n \neq -1 \quad D_f = \{R\} \rightarrow$ چون x همیشه مثبت است

ب) $x^n - 1 \neq 0 \rightarrow x^n \neq 1 \rightarrow R - \{0\}$

ج) $x^n \neq 2 \rightarrow x \neq \sqrt[n]{2} \quad R - \{0, \sqrt[n]{2}\}$

د) $x^n - 2 \neq 0 \quad x^n \neq 0 \rightarrow x \neq \sqrt[n]{2} \quad R - \{\sqrt[n]{2}\}$

الف) $x_{k+1} \in W \quad x_k \in W-1 \quad D_f = \{x | x = \frac{k-1}{e}, k \in W\}$

ب) $\frac{x_k - 1}{x_k - \omega} \in W \quad x_k - 1 \in W \quad x_k - \omega \in W \quad x_k - 1 \in W \quad x_k - \omega \in W$

$x = \frac{x_k - \omega}{x_k - 1}$ $D_f = \{x | x = \frac{ak - 1}{pk - 1}, k \in W\}$