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الف) $\frac{x^2-4}{x^3-x} \geq 0 \rightarrow \frac{x(x-2)}{x(x^2-1)} \geq 0$ $D_f = (-1, 0) \cup (2, +\infty)$

ب) $\frac{x^5-x^3}{x^3-x} \geq 0 \rightarrow \frac{x^3(x^2-1)}{x(x^2-1)} \geq 0$ $D_f = \mathbb{R} - \{0, -1, 1\}$

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

ب) $x|x| \geq 0 \rightarrow \begin{matrix} +\sqrt{x} \\ -x \\ 0 \end{matrix} \rightarrow D_f = \mathbb{R}^+ \cup (0, +\infty)$

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الف) $2 - [x] \geq 0 \rightarrow [x] \leq 2 \rightarrow x < 3 \rightarrow D_f = (-\infty, 3)$

ب) $[x] \geq 0 \rightarrow [x] < 2 \rightarrow x < 2 \rightarrow D_f = (-\infty, 2)$

الف) $[x - \frac{1}{3}] + [x + \frac{1}{3}] \geq 0 \rightarrow [x + \frac{1}{3} - 1] + [x + \frac{1}{3}] \geq 0 \rightarrow [x + \frac{1}{3}] - 1 + [x + \frac{1}{3}] \geq 0$
 $\rightarrow 2[x + \frac{1}{3}] \geq 1 \rightarrow [x + \frac{1}{3}] \geq \frac{1}{2} \rightarrow x + \frac{1}{3} \geq 1 \rightarrow x \geq \frac{2}{3} \rightarrow D_f = [\frac{2}{3}, +\infty)$

ب) $[x - \frac{1}{3}] + [-x + \frac{1}{3}] \geq 0 \stackrel{!}{\rightarrow} a \in \mathbb{Z} [a] + [-a] = 0 \rightarrow x - \frac{1}{3} \in \mathbb{Z} \rightarrow$
 $a \notin \mathbb{Z} [a] + [-a] = -1 \times$
 $D_f = \{x | x = \frac{1}{3} + n, n \in \mathbb{Z}\}$

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الف) $\sin x - 1 \neq 0 \rightarrow \sin x \neq 1$  $D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{2}\}$

ب) $\sin^2 x - 1 \neq 0 \rightarrow \sin^2 x \neq \frac{1}{4} \rightarrow \sin x \neq \pm \sqrt{\frac{1}{4}}$ 
 $D_f = \mathbb{R} - \{k\pi + \frac{\pi}{6}, k\pi + \frac{5\pi}{6}\}$

ا) $\sqrt{1-\sin x} - 1 \geq 0 \rightarrow \sin x \geq \frac{1}{2}$  $\frac{\pi}{6} \leq x \leq \frac{5\pi}{6}$
 $\rightarrow D_f = [2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}]$

ب) $\cos x - 1 \geq 0 \rightarrow \cos x \geq 1$  $\rightarrow -1 \leq \cos x \leq 1$
 $D_f = \{2k\pi\}$

ا) $-1 \leq |x-1| \leq 1 \rightarrow |x-1| \leq 1 \rightarrow |x| \leq 2 \rightarrow -2 \leq x \leq 2$
 $|x-1| \geq -1 \rightarrow |x| \geq 2 \rightarrow x \geq 2 \text{ or } x \leq -2$
 $D_f = [-2, -1] \cup [1, 2]$
 ب) $-1 \leq x^2 + 3x + 1 \leq 1 \rightarrow x^2 + 3x + 1 \leq 1 \rightarrow x^2 + 3x \leq 0 \rightarrow x(x+3) \leq 0$
 $D_f = [-3, 0]$
 $x^2 + 3x + 1 \geq -1 \rightarrow x^2 + 3x + 2 \geq 0 \rightarrow (x+1)(x+2) \geq 0$
 $D_f = [-3, -2] \cup [-1, 0]$

ا) $x^2 > 0 \rightarrow x \neq 0$ $2 - \log_2(x-1) \geq 0 \rightarrow \log_2(x-1) \leq 2 \rightarrow x-1 \leq 4$
 $D_f = (2, 11]$ $x \leq 11$
 ب) $x^2 - x > 0 \rightarrow x(x-1) > 0$
 $D_f = (-1, 0) \cup (1, +\infty)$

ا) $\frac{x}{x+1} \neq 0 \rightarrow x \neq -1 \rightarrow D_f = \mathbb{R}$
 ب) $\frac{x}{x-1} \neq 0 \rightarrow x \neq 1 \rightarrow x \neq 0 \rightarrow D_f = \mathbb{R} - \{0\}$
 ج) $\frac{x}{x-2} \neq 0 \rightarrow x \neq 2 \rightarrow x \neq \log_2 2 \rightarrow D_f = \mathbb{R} - \{\log_2 2\}$
 د) $\frac{x}{x-3} \neq 0 \rightarrow x \neq 3 \rightarrow x \neq \log_2 3 \rightarrow D_f = \mathbb{R} - \{\log_2 3\}$

ا) $kx + 1 \in W \rightarrow kx \in W - 1 \rightarrow x \in \frac{W-1}{k}$ $D_f = \{x | x = \frac{k-1}{k}, k \in W\}$
 ب) $\frac{kx-1}{kx-2} \in W \rightarrow kx-1 = kWx - \Delta W \rightarrow kx - kWx = +1 - \Delta W$
 $x = \frac{1 - \Delta W}{k - 2W} \rightarrow D_f = \{x | x = \frac{\Delta K - 1}{2K - 3}, k \in W\}$