

الف) $y = \frac{\sqrt{x^2 - 9x}}{x^3 - x} \rightarrow \frac{x(x-9)}{x(x-1)(x+1)} > 0 \rightarrow -\frac{1}{x} + \frac{1}{x-1} - \frac{1}{x+1} > 0$
 $D_f = (-1, 0) \cup (0, 1) \cup [4, +\infty)$

ب) $y = \frac{\sqrt{x^3 - x^2}}{x^3 - x} \rightarrow \frac{x^2(x-1)}{x(x-1)(x+1)} > 0 \rightarrow \frac{1}{x} + \frac{1}{x+1} > 0$
 $D_f = (-\infty, -1) \cup (-1, 0) \cup (0, 1) \cup (1, +\infty)$

الف) $y = \frac{x+1}{\sqrt{x+|x|}} \rightarrow x+|x| > 0 \rightarrow x > 0 \rightarrow |x| = x \rightarrow x+x > 0 \rightarrow x > 0 \rightarrow (0, +\infty)$
 $x < 0 \rightarrow |x| = -x \rightarrow x+(-x) > 0 \rightarrow 0 > 0 \times \rightarrow D_f = (0, +\infty)$

ب) $y = \frac{1}{\sqrt{x|x|}} \rightarrow x|x| > 0 \rightarrow x > 0 \rightarrow |x| = x \rightarrow x \cdot x > 0 \rightarrow (0, +\infty)$
 $x < 0 \rightarrow |x| = -x \rightarrow x(-x) > 0 \rightarrow -x^2 > 0 \rightarrow x^2 < 0 \times$
 $x = 0 \rightarrow \text{مخرج صفر شود} \rightarrow D_f = (0, +\infty)$

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

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

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

ب) $y = \sqrt{[x - \frac{1}{n}] + [-x + \frac{1}{n}]} \rightarrow \sqrt{[a] + [-a]} \rightarrow 0 \leftarrow a \in \mathbb{Z}'$
 $x - \frac{1}{n} \in \mathbb{Z}' \rightarrow x \in \mathbb{Z}' + \frac{1}{n} \rightarrow D_f = \{n + \frac{1}{n} | n \in \mathbb{Z}'\}$

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

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

الف) $y = \sqrt{1 - \sin x} \rightarrow 1 - \sin x \geq 0 \rightarrow \sin x \leq 1$ $D_f = \left[2k\pi + \frac{\pi}{4}, 2k\pi + \frac{5\pi}{4} \right] (k \in \mathbb{Z})$ ب) $y = \sqrt{\cos x} \rightarrow \cos x \geq 0 \rightarrow \cos x \geq 1$ $\cos x \rightarrow \cos x = 1 \rightarrow D_f = \{2k\pi k \in \mathbb{Z}\}$	6
الف) $y = \cos y = x - 3 \rightarrow -1 \leq x - 3 \leq 1 \rightarrow -1 \leq x \rightarrow 2 \leq x$ $x - 3 \leq 1 \rightarrow x \leq 4 \rightarrow -4 \leq x \leq 4 \rightarrow D_f = [-4, -2] \cup [2, 4]$ ب) $y = \arcsin(x^2 + 3x + 1) \rightarrow -1 \leq x^2 + 3x + 1 \leq 1 \rightarrow x^2 + 3x + 2 \geq 0 \rightarrow (x+2)(x+1) \geq 0$ $x \in (-\infty, -2] \cup [-1, +\infty) / x^2 + 3x \leq 0 \rightarrow x(x+3) \leq 0 \rightarrow x \in [-3, 0]$ $D_f = [-3, -2] \cup [-1, 0]$	7
الف) $y = \sqrt{1 - \log_w(x+2)} \rightarrow x+2 \geq 0 \rightarrow x \geq -2 / 1 - \log_w(x+2) \geq 0 \rightarrow 1 \geq \log_w(x+2)$ $w^1 \geq x+2 \rightarrow 9 \geq x+2 \rightarrow x \leq 7 \rightarrow D_f = (-2, 7]$ ب) $y = \log(x^3 - x) \rightarrow x^3 - x > 0 \rightarrow x(x^2 - 1) > 0 \rightarrow x(x-1)(x+1) > 0$ $D_f = (-1, 0) \cup (1, +\infty)$	8
الف) $y = \frac{w}{x+1}$ مع $x \in \mathbb{R}$ و w ثابت. $\rightarrow D_f = \mathbb{R}$ ب) $y = \frac{w}{x-1} \rightarrow x-1 \neq 0 \rightarrow x \neq 1 \rightarrow D_f = \mathbb{R} - \{1\}$ ج) $y = \frac{w}{x^2-2} \rightarrow x^2-2 \neq 0 \rightarrow x^2 \neq 2 \rightarrow (x^2)^2 \neq 2^2 \rightarrow x^4 \neq 4 \rightarrow x \neq \pm \sqrt[4]{4} \rightarrow D_f = \mathbb{R} - \{\pm \sqrt[4]{4}\}$ د) $y = \frac{w}{x^3-3} \rightarrow x^3-3 \neq 0 \rightarrow x^3 \neq 3 \rightarrow \log_x^3 \rightarrow D_f = \mathbb{R} - \{\log_x^3\}$	9
الف) $y = (\varepsilon x + 1)! \rightarrow \varepsilon x + 1 \in \mathbb{W} \rightarrow \varepsilon x \in \mathbb{W} - 1 \rightarrow x \in \frac{\mathbb{W}-1}{\varepsilon}$ $D_f = \left\{ x \mid x = \frac{K-1}{\varepsilon}, K \in \mathbb{W} \right\}$ ب) $y = \left(\frac{x^2-2}{x^2-4} \right)! \rightarrow \frac{x^2-2}{x^2-4} \in \mathbb{W} \rightarrow x^2-2 = w(x^2-4) \rightarrow x^2-2 = wx^2-4w \rightarrow x^2-2 = -4w+x^2$ $x = \frac{-4w+2}{1-2w} \rightarrow D_f = \left\{ x \mid x = \frac{2-4w}{1-2w}, K \in \mathbb{W} \right\}$	10