

الف) $y = \sqrt{4 - \sqrt{2-x}}$ $\begin{cases} 4 - \sqrt{2-x} \geq 0 \rightarrow 4 \geq \sqrt{2-x} \rightarrow 2-x \leq 14 \rightarrow -12 \leq x \\ 2-x \geq 0 \rightarrow 2 \geq x \end{cases} \cap \rightarrow [-12, 2] = D_f$

ب) $y = \sqrt{3 - \sqrt{x-2}}$ $\begin{cases} 3 - \sqrt{x-2} \geq 0 \rightarrow 3 \geq \sqrt{x-2} \rightarrow x-2 \leq 9 \rightarrow x \leq 11 \\ x-2 \geq 0 \rightarrow x \geq 2 \end{cases} \cap x \leq 11 = [2, 11] = D_f$

الف) $y = \sqrt{4 - 2x^2}$ $\begin{cases} 4 - 2x^2 \geq 0 \rightarrow 2 \geq x^2 \rightarrow -\sqrt{2} \leq x \leq \sqrt{2} \end{cases} \rightarrow D_f = [-\sqrt{2}, \sqrt{2}]$

ب) $y = \sqrt{3|x| - 9}$ $\begin{cases} 3|x| - 9 \geq 0 \rightarrow 3|x| \geq 9 \rightarrow |x| \geq 3 \rightarrow x \geq 3 \text{ or } x \leq -3 \end{cases} \cap D_f = [3, +\infty) \cup (-\infty, -3]$

الف) $y = \sqrt{\frac{|x|+1}{|x|-3}}$ $\begin{cases} \frac{|x|+1}{|x|-3} \geq 0 \rightarrow |x|-3 > 0 \rightarrow |x| > 3 \rightarrow x > 3 \text{ or } x < -3 \end{cases} \cap D_f = (3, +\infty) \cup (-\infty, -3)$

ب) $y = \sqrt{\frac{\sqrt{x}+1}{\sqrt{x}-3}}$ $\begin{cases} \frac{\sqrt{x}+1}{\sqrt{x}-3} \geq 0 \rightarrow \sqrt{x}-3 > 0 \rightarrow \sqrt{x} > 3 \rightarrow x > 9 \end{cases} \rightarrow D_f = (9, +\infty) - \{9\}$

الف) $y = \sqrt{3 - |x|}$ $\begin{cases} 3 - |x| \geq 0 \rightarrow 3 \geq |x| \rightarrow -3 \leq x \leq 3 \end{cases} \rightarrow D_f = [-3, 3]$
 $|x| + 2 \rightarrow R$ $|x| + 2 \rightarrow R$

ب) $y = \sqrt{4 - x^2}$ $\begin{cases} 4 - x^2 \geq 0 \rightarrow -2 \leq x \leq 2 \\ |x| - 1 \rightarrow |x| \neq 1 \rightarrow x \neq 1, -1 \end{cases} \rightarrow D_f = [-2, 2] - \{1, -1\}$

الف) $y = \frac{x+1}{\sqrt{x+|x|}}$ $\begin{cases} x+|x| > 0 \rightarrow |x| > -x \rightarrow D_f = R^+ \cup (0, +\infty) \end{cases}$
 $\begin{matrix} \circ x \\ + \sqrt{} \\ - x \end{matrix}$

ب) $y = \frac{1}{\sqrt{x/|x|}}$ $\begin{cases} x/|x| > 0 \rightarrow x > 0 \end{cases} \rightarrow D_f = R^+ \cup (0, +\infty)$
 $\begin{matrix} + \sqrt{} \\ \circ x \\ - x \end{matrix}$

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

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ب) $y = \frac{1}{\sqrt{2 - [x]}}$ $\left. \begin{array}{l} 2 - [x] > 0 \\ 2 > [x] \end{array} \right\} x < 2 \rightarrow D_f = (-\infty, 2)$

الف) $y = \frac{1}{x[x]} \rightarrow x[x] \neq 0 \rightarrow \begin{array}{l} \odot \times \\ \ominus \checkmark \\ \oplus \checkmark \end{array} \Rightarrow D_f = \mathbb{R} - \{0\}$

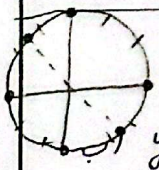
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ب) $y = \frac{1}{\sqrt{-x[x]}}$ $\left. \begin{array}{l} -x[x] > 0 \\ \odot \times \\ \oplus \times \\ -x \end{array} \right\} D_f = \emptyset$

الف) $y = \sqrt{[x - \frac{1}{r}] + [x + \frac{r}{r}]} \rightarrow [x - \frac{1}{r}] + [x + \frac{r}{r}] \geq 0 \rightarrow [x + \frac{r}{r} - 1] + [x + \frac{r}{r}] \geq 0$
 $[x + \frac{r}{r}] - 1 + [x + \frac{r}{r}] \geq 0 \rightarrow 2[x + \frac{r}{r}] \geq 1 \Rightarrow [x + \frac{r}{r}] \geq \frac{1}{2} \Rightarrow x + \frac{r}{r} \geq 1 \rightarrow D_f = x \geq \frac{1}{r}$

ب) $y = \sqrt{[x - \frac{1}{r}] + [-x + \frac{1}{r}]}$ $\left. \begin{array}{l} a \in \mathbb{Z} [a] + [-a] = 0 \\ a \notin \mathbb{Z} [a] + [-a] = -1 \end{array} \right\} \begin{array}{l} x \in \frac{\mathbb{Z} + 1}{r} \\ x - \frac{1}{r} \in \mathbb{Z} \end{array}$
 $D_f = \{x \mid x = k + \frac{1}{r}, k \in \mathbb{Z}\}$

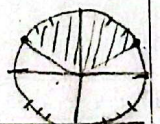
الف) $y = \frac{1}{r \sin^2 x - 1}$ $\left. \begin{array}{l} r \sin^2 x - 1 > 0 \\ r \sin^2 x > 1 \\ \sin^2 x > \frac{1}{r} \\ \sin x > \pm \sqrt{\frac{1}{r}} \end{array} \right\} D_f = \mathbb{R} - \{k\pi \pm \frac{\pi}{r}\}$



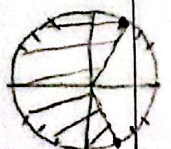
ب) $y = \frac{\cos x}{\tan x + 1}$ $\left. \begin{array}{l} \frac{\cos x}{\sin x} \neq 0 \rightarrow x \neq \pi, 2\pi \\ \tan x + 1 \neq 0 \rightarrow \tan x \neq -1 \rightarrow x \neq \frac{3\pi}{4}, \frac{7\pi}{4} \end{array} \right\} D_f = \mathbb{R} - \{k\pi, k\pi + \frac{\pi}{r}, k\pi - \frac{\pi}{r}\}$

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الف) $y = \sqrt{r \sin x - 1} \rightarrow r \sin x \geq 1 \rightarrow \sin x \geq \frac{1}{r}$
 $D_f = [2k\pi + \frac{\pi}{4}, 2k\pi + \frac{3\pi}{4}]$



ب) $y = \sqrt{1 - r \cos x} \rightarrow 1 - r \cos x \geq 0 \rightarrow \cos x \leq \frac{1}{r}$
 $D_f = [2k\pi + \frac{3\pi}{4}, 2k\pi + \frac{5\pi}{4}]$



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