

الف) $y = \sqrt{4 - \sqrt{2-x}}$

$2-x > 0 \rightarrow x \leq 2$

$4 - \sqrt{2-x} \geq 0 \rightarrow \sqrt{2-x} \leq 4 \rightarrow 2-x \leq 16 \rightarrow x \geq -14$

$D_f = [-14, 2]$

ب) $y = \sqrt{3 - \sqrt{x-2}}$

$x-2 \geq 0 \rightarrow x \geq 2$

$3 - \sqrt{x-2} \geq 0 \rightarrow \sqrt{x-2} \leq 3 \rightarrow x-2 \leq 9 \rightarrow x \leq 11$

$D_f = [2, 11]$

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

ب) $y = \sqrt{3|x|-9} \rightarrow 3|x|-9 \geq 0 \rightarrow 3|x| \geq 9 \rightarrow |x| \geq 3 \rightarrow x \geq 3$
 $\rightarrow x \leq -3$

$\hookrightarrow D_f = (-\infty, -3] \cup [3, +\infty)$

الف) $y = \sqrt[3]{\frac{|x|+1}{|x|-3}}$ $|x|-3 \neq 0 \rightarrow |x| \neq 3 \rightarrow x \neq \pm 3 \rightarrow D_f = \mathbb{R} - \{\pm 3\}$

ب) $y = \sqrt[3]{\frac{\sqrt{x}+1}{\sqrt{x}-3}}$

$x \geq 0$

$\sqrt{x}-3 \neq 0 \rightarrow \sqrt{x} \neq 3 \rightarrow x \neq 9$

$D_f = \mathbb{R}^+ \cup \{0\} - \{9\}$

الف) $\frac{\sqrt{3-|x|}}{|x|+2}$

$3-|x| \geq 0 \rightarrow |x| \leq 3 \rightarrow -3 \leq x \leq 3 \rightarrow D_f = [-3, 3]$

$|x|+2 \neq 0 \rightarrow |x| \neq -2 \checkmark$

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ب) $\frac{\sqrt{4-x^2}}{|x|-1}$

$4-x^2 \geq 0 \rightarrow x^2 \leq 4 \rightarrow -2 \leq x \leq 2$
 $|x|-1 \neq 0 \rightarrow |x| \neq 1 \rightarrow x \neq \pm 1 \rightarrow D_f = [-2, 2] - \{\pm 1\}$

الف) $y = \frac{x+1}{\sqrt{x+|x|}}$

$x+|x| > 0$

$\left. \begin{matrix} \oplus \checkmark \\ \ominus \times \\ \ominus \times \end{matrix} \right\} \rightarrow D_f = \mathbb{R}^+$

ب) $\frac{1}{\sqrt{x|x|}}$

$x|x| > 0$

$\left. \begin{matrix} \oplus \checkmark \\ \ominus \times \\ \ominus \times \end{matrix} \right\} \rightarrow D_f = \mathbb{R}^+$

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

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

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الف) $y = \frac{1}{n[n]}$ $\rightarrow n[n] \neq 0 \rightarrow n \neq 0$
 $\rightarrow [n] \neq 0 \rightarrow n \neq [0, 1) \} \rightarrow D_f = \mathbb{R} - [0, 1)$

ب) $y = \frac{1}{\sqrt{-n[n]}}$ $-n[n] > 0$
 $\left. \begin{matrix} \oplus \infty \\ \ominus \infty \\ \ominus \infty \end{matrix} \right\} \rightarrow D_f = \emptyset$

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الف) $y = \sqrt{[n - \frac{1}{r}] + [n + \frac{r}{r}]}$ $[n - \frac{1}{r}] + [n + \frac{r}{r}] + 1 \geq 1 \rightarrow [n + \frac{r}{r}] + [n + \frac{r}{r}] \geq 1$

$r[n + \frac{r}{r}] \geq 1 \rightarrow [n + \frac{r}{r}] \geq \frac{1}{r} \rightarrow n + \frac{r}{r} \geq 1 \rightarrow n \geq \frac{1}{r}$

ب) $y = \sqrt{[n - \frac{1}{r}] + [-n + \frac{1}{r}]}$ $\rightarrow \sqrt{[a] + [-a]} \rightarrow [a] + [-a] \geq 0 \rightarrow \underbrace{a}_{n - \frac{1}{r}} \in \mathbb{Z} \rightarrow n - \frac{1}{r} \in \mathbb{Z}$

$n \in \mathbb{Z} + \frac{1}{r} \rightarrow D_f = \{n | n \geq k + \frac{1}{r}, k \in \mathbb{Z}\}$

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الف) $y = \frac{1}{r \sin^r n - 1}$ $r \sin^r n - 1 \neq 0 \rightarrow r \sin^r n \neq 1 \rightarrow \sin^r n \neq \frac{1}{r} \rightarrow \sin n \neq \pm \sqrt[r]{\frac{1}{r}}$
 $D_f = \mathbb{R} - \left\{ k\pi \pm \frac{\pi}{r} \right\}$

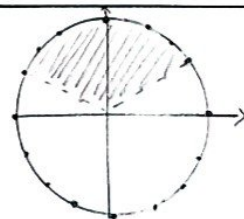
ب) $y = \frac{\cot n + 1}{\tan n + 1}$ $\cot n = \frac{\cos n}{\sin n} \rightarrow \sin n \neq 0 \rightarrow n \neq k\pi, \pi$
 $\tan n = \frac{\sin n}{\cos n} \rightarrow \cos n \neq 0 \rightarrow n \neq \frac{\pi}{r}, \frac{3\pi}{r}$

$\tan n + 1 \neq 0 \rightarrow \tan n \neq -1$
 $\rightarrow n \neq \frac{3\pi}{r}, \frac{7\pi}{r}$ $D_f = \mathbb{R} - \left\{ k\pi, k\pi + \frac{\pi}{r}, k\pi + \frac{3\pi}{r} \right\}$

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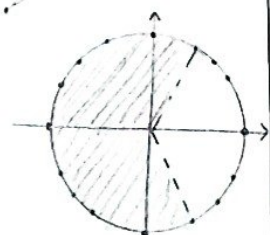
الف) $y = \sqrt{r \sin n - 1}$ $r \sin n - 1 \geq 0 \rightarrow r \sin n \geq 1 \rightarrow \sin n \geq \frac{1}{r}$

$D_f = [2k\pi + \frac{\pi}{r}, 2k\pi + \frac{5\pi}{r}]$



ب) $y = \sqrt{1 - r \cos n}$ $1 - r \cos n \geq 0 \rightarrow r \cos n \leq 1 \rightarrow \cos n \leq \frac{1}{r}$

$D_f = [2k\pi + \frac{\pi}{r}, 2k\pi + \frac{5\pi}{r}]$



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