

الف) $\sqrt{2-x} \geq 0$

$\sqrt{2-x} \geq 0 \rightarrow 19 \geq 2-x \rightarrow x \geq -14$

$I = [-14, +\infty)$

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

$II = (-\infty, 2]$

$I \cap II = [-14, 2] \quad D_f = [-14, 2]$

(1)

ب) $y = \sqrt{1-\sqrt{x-2}}$

$1-\sqrt{x-2} \geq 0$

$1 \geq \sqrt{x-2}$

$1 \geq x-2 \rightarrow x \leq 3$

$\sqrt{x-2} \geq 0$

$x-2 \geq 0$

$x \geq 2$

$I = (-\infty, 11]$

$\cap \rightarrow [2, 11]$

$II = [2, +\infty)$

(1)

الف) $y = \sqrt{4-x^2}$

$4-x^2 \geq 0 \quad D_f = [-2, 2]$

$12 \leq 4$

$x^2 \leq 4$

$-2 \leq x \leq 2 \rightarrow -\sqrt{4} \leq x \leq \sqrt{4}$

ب) $y = \sqrt{1-x^2-9}$

$1-x^2-9 \geq 0$

$1-x^2 \geq 9$

$1 \geq x^2$

$x \leq -1 \leq x \geq 1$

$D_f = (-\infty, -1] \cup [1, +\infty)$ (2)

الف) $y = \sqrt{\frac{|x|+1}{|x|-1}}$

$|x| \neq 1$

$x \neq \pm 1$

$D_f = \mathbb{R} - \{\pm 1\}$

$= (-\infty, +\infty) - \{\pm 1\}$

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

$\sqrt{x} \neq 1$

$x \neq 1$

$D_f = \mathbb{R} - \{1\}$

$= [0, +\infty) - \{1\}$

(2)

الف) $y = \sqrt{1-|x|}$

$1-|x| \geq 0$

$|x| \leq 1$

$-1 \leq x \leq 1$

$D_f = [-1, 1]$

ب) $y = \frac{\sqrt{4-x^2}}{|x|-1}$

$|x| \neq 1$

$x \neq \pm 1$

$4-x^2 \geq 0$

$x^2 \leq 4 \rightarrow -2 \leq x \leq 2$

$D_f = [-2, 2] - \{\pm 1\}$

(2)

الف) $y = \frac{x+1}{\sqrt{x+|x|}}$

$x=0$

$0+0=0 \rightarrow x$

$|x|=x$

$x \geq 0 \rightarrow \oplus \checkmark \quad D_f = (0, +\infty)$

$|x|=-x$

$x-x=0 \rightarrow x$

$x+|x| \neq 0$

ب) $y = \frac{1}{\sqrt{x|x|}}$

$x=0$

$0 \times 0 = 0 \rightarrow x$

$|x|=x$

$x \geq 0 \rightarrow \oplus \checkmark \quad D_f = (0, +\infty)$

$|x|=-x$

$-x \leq 0 \rightarrow \ominus \checkmark \quad x$

(2)

الف) $y = \sqrt{2-[x]}$

$2-[x] \geq 0$

$[x] \leq 2$

$D_f = (-\infty, 2)$

ب) $y = \frac{1}{\sqrt{2-[x]}}$

$2-[x] > 0$

$[x] < 2$

$D_f = (-\infty, 2)$

(2)

الف) $y = \frac{1}{x[x]}$

$x[x] > 0$

$x[x] < 0$

$D_f = (-\infty, 0) \cup (1, +\infty)$

ب) $y = \frac{1}{\sqrt{-x[x]}}$

مثبت = منفی x منفی
x منفی دار [x] مثبت
کوچکتر از صفر یا بیشتر از صفر
دقیقت ندارد

$D_f = (-\infty, 0)$

(2)

$x > 0 \rightarrow [x] \geq 0 \rightarrow -x[x] \leq 0 \rightarrow x$

$x < 0 \rightarrow -x > 0 \rightarrow [x] < -1 \rightarrow -x, [x] < 0$

$x = 0 \rightarrow \text{no } x$

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

$[x-\frac{1}{r}] + [x+\frac{r}{r}] \geq 0$

$r[x+\frac{r}{r}] \geq 1$

$[x+\frac{r}{r}-1] + [x+\frac{r}{r}] \geq 0$

$[x+\frac{r}{r}] \geq \frac{1}{r}$

$[x+\frac{r}{r}]-1 + x+\frac{r}{r} \geq 0$

$x+\frac{r}{r} \geq 1 \rightarrow x \geq \frac{1}{r}$

$D_f = [\frac{1}{r}, +\infty)$

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

if $\begin{cases} a \in \mathbb{Z} & [a] + [-a] = 0 \\ a \notin \mathbb{Z} & [a] + [-a] = -1 \end{cases} \Rightarrow x - \frac{1}{r} \in \mathbb{Z}$

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

(1)

الف) $y = \frac{1}{r \sin^r x - 1}$

$r \sin^r x - 1 \neq 0$

$r \sin^r x \neq 1$

$\sin^r x \neq \frac{1}{r}$

$\sin x \neq \pm \sqrt[r]{\frac{1}{r}}$

$\sin x = \frac{\sqrt{r}}{r} \rightarrow x = \frac{\pi}{2} + k\pi \leq x = \frac{r\pi}{2} + k\pi$

$\sin x = -\frac{\sqrt{r}}{r} \rightarrow x = -\frac{\pi}{2} + k\pi \leq x = -\frac{r\pi}{2} + k\pi$

مثبت: $x = k\frac{\pi}{r} + \frac{\pi}{r}$ منفی: $x = k\frac{\pi}{r} - \frac{\pi}{r}$ $D_f = \mathbb{R} - \{k\frac{\pi}{r} + \frac{\pi}{r} | k \in \mathbb{Z}\}$

ب) $y = \frac{\cos x + 1}{\tan x + 1}$

$\frac{\cos x}{\sin x} \sin x \neq 0$

$\tan x + 1 \neq 0$

$\tan x \neq -1$

$\tan x = -1 \rightarrow x = k\pi - \frac{\pi}{4} = k\pi + \frac{3\pi}{4}$

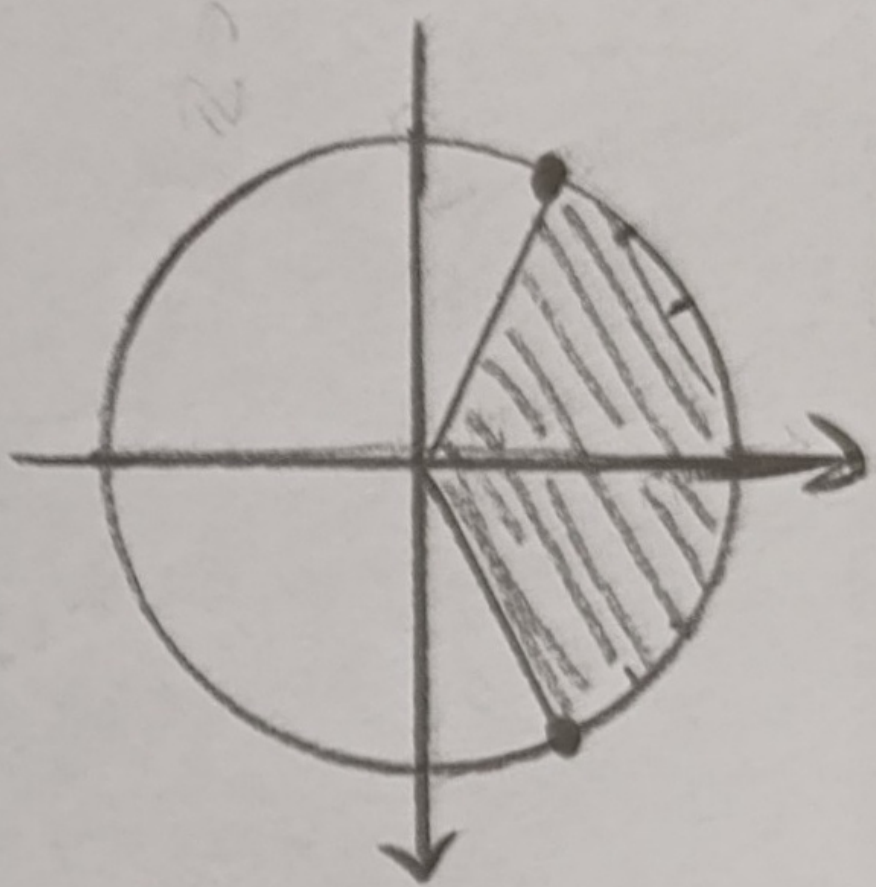
$D_f = \mathbb{R} - \{k\pi, k\pi + \frac{3\pi}{4} | k \in \mathbb{Z}\}$

(2)

$$iii) y = \sqrt{r \sin x - 1}$$

$$r \sin x - 1 \geq 0 \Rightarrow \sin x \geq \frac{1}{r}$$

$$D_f = \left[k\pi + \frac{\pi}{4}, k\pi + \frac{3\pi}{4} \right]$$



$$iv) y = \sqrt{1 - r \cos x}$$

$$1 - r \cos x \geq 0$$

$$r \cos x \leq 1$$

$$\cos x \leq \frac{1}{r}$$

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

