

$$\text{الف) } \frac{x+3}{2x^2+5x^2-1x+3} \rightarrow x=-3$$

$$2x^2+5x^2-1x+3 \xrightarrow{\div x-1} (x-1)(2x-1)(x+3) \rightarrow x=-3, 1, \frac{1}{2}$$

$$\begin{array}{r} 2x^2+5x^2-1x+3 \quad \div x-1 \\ \underline{2x^2-2x^2} \\ 7x^2-1x+3 \quad \div x-1 \\ \underline{7x^2-7x} \\ 6x+3 \quad \div x-1 \\ \underline{6x-6} \\ 9 \end{array}$$

$$D_f = \mathbb{R} - \left\{ -3, \frac{1}{2}, 1 \right\}$$

$$\text{ب) } \frac{x+3}{2x^2+9x^2+1 \cdot x+3} \rightarrow x=-3$$

$$2x^2+9x^2+1 \cdot x+3 \xrightarrow{\div x+1} (x+1)(2x+1)(x+3) \rightarrow x=-3, -1, -\frac{1}{2}$$

$$\begin{array}{r} 2x^2+9x^2+1 \cdot x+3 \quad \div x+1 \\ \underline{2x^2+2x} \\ 7x^2+1x+3 \quad \div x+1 \\ \underline{7x^2+7x} \\ -6x+3 \quad \div x+1 \\ \underline{-6x-6} \\ 9 \end{array}$$

$$D_f = \mathbb{R} - \left\{ -3, -\frac{1}{2}, -1 \right\}$$

$$\text{الف) } \frac{x+3}{x^2-2x^2+2x-1} \xrightarrow{\div x-1} (x-1)(x^2-x+1)$$

$$\begin{array}{r} x^2-2x^2+2x-1 \quad \div x-1 \\ \underline{x^2-x} \\ -x^2+2x-1 \quad \div x-1 \\ \underline{-x^2+x} \\ -x-1 \quad \div x-1 \\ \underline{-x+1} \\ -2 \end{array}$$

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

$$\text{ب) } x = -3, 1$$

$$\begin{array}{c} -3 \quad 1 \\ + \quad - \quad + \quad + \end{array}$$

$$D_f = (-\infty, -3] \cup (1, +\infty)$$

$$y = \frac{2}{x^2 - \omega |x-1| - 2x + \omega}$$

$$\begin{aligned} x \geq 1 &\rightarrow x^2 - \sqrt{x} + 1 \neq 0 \rightarrow (x-2)(x-\omega) \neq 0 \rightarrow x \neq 2, \omega \\ x \leq 1 &\rightarrow x^2 + \omega x - \omega - 2x \neq 0 \rightarrow x^2 + \omega x \rightarrow x(x+\omega) \neq 0 \\ &\quad x \neq 0, -\omega \end{aligned}$$

$$D_f = \mathbb{R} - \{ -\omega, 0, 2, \omega \}$$

(4)

الف) $[-x] - 2 \geq 0$

$$[-x] \geq 2 \rightarrow x \leq -2 \rightarrow D_f = (-\infty, -2]$$

ب) $[x]^2 - 2[x] - 2 \neq 0$

$$([x] - 3)([x] + 1) \neq 0$$

$$[x] \neq 3 \rightarrow 3 \leq x < 4$$

$$[x] \neq -1 \rightarrow -1 \leq x < 0$$

$$D_f = \mathbb{R} - \{[-1, 0) \cup [3, 4)\}$$

(5)

الف) $[x - \frac{1}{3}] + [x + \frac{2}{3}] \geq 0$

$$[x + \frac{2}{3}] + [x + \frac{2}{3}] \geq 1$$

$$[x + \frac{2}{3}] \geq \frac{1}{2} \rightarrow [x + \frac{2}{3}] \geq 1$$

$$x + \frac{2}{3} \geq 1$$

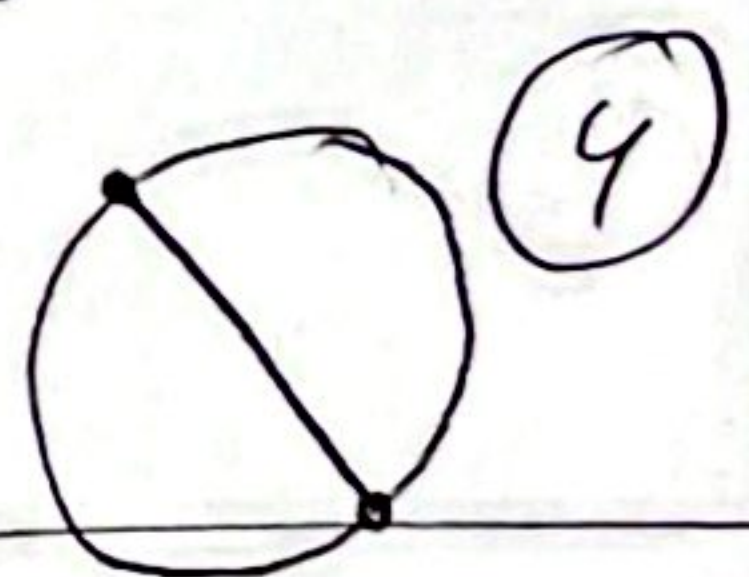
$$x \geq \frac{1}{3}$$

$$D_f = [\frac{1}{3}, +\infty)$$

ب) $[x - \frac{1}{3}] + [-\frac{(x + \frac{1}{3})}{a}] \geq 0 \rightarrow a \in \mathbb{Z} \rightarrow [a] + [-a] = 0 \checkmark$
 $a \notin \mathbb{Z} \rightarrow [a] + [-a] = -1 \times$

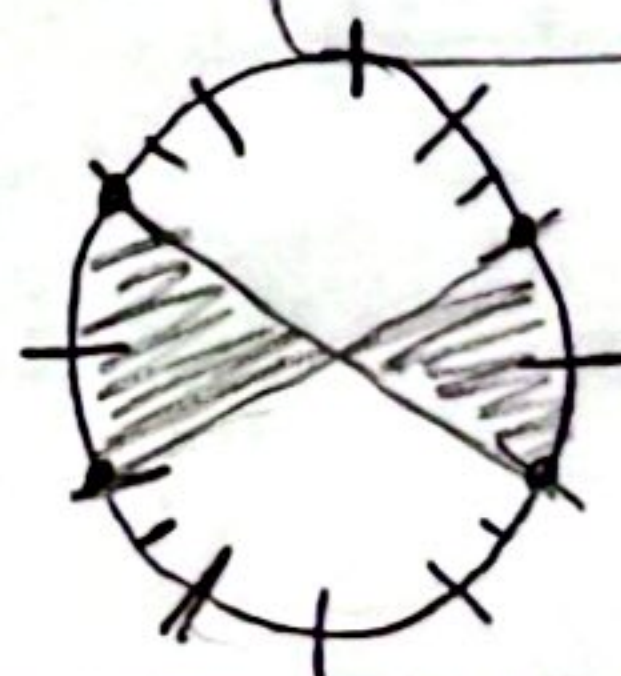
$$x - \frac{1}{3} \in \mathbb{Z} \rightarrow x \in \mathbb{Z} + \frac{1}{3} \rightarrow D_f = \{x \mid x = k + \frac{1}{3}, k \in \mathbb{Z}\}$$

الف) $\tan x \neq -1 \rightarrow x \neq 135^\circ, 315^\circ \rightarrow D_f = \mathbb{R} - \{k\pi + \frac{3\pi}{4}\}$



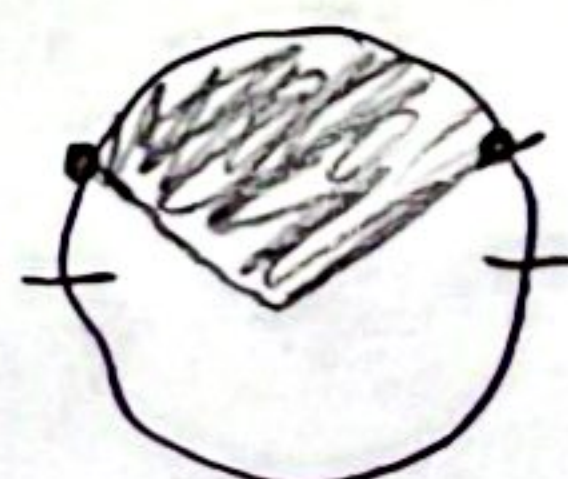
ب) $1 - \sqrt{3} \sin x \geq 0$

$$\sin x \leq \frac{1}{\sqrt{3}} \rightarrow -\frac{1}{\sqrt{3}} \leq \sin x \leq \frac{1}{\sqrt{3}}$$



$$D_f = [k\pi - \frac{\pi}{6}, k\pi + \frac{\pi}{6}]$$

الف) $\sin x \geq \frac{1}{2}$



$$D_f = [2k\pi + \frac{\pi}{6}, (2k+1)\pi + \frac{5\pi}{6}]$$

ب) $1 - 2 \cos x \geq 0$

$$\cos x \leq \frac{1}{2}$$

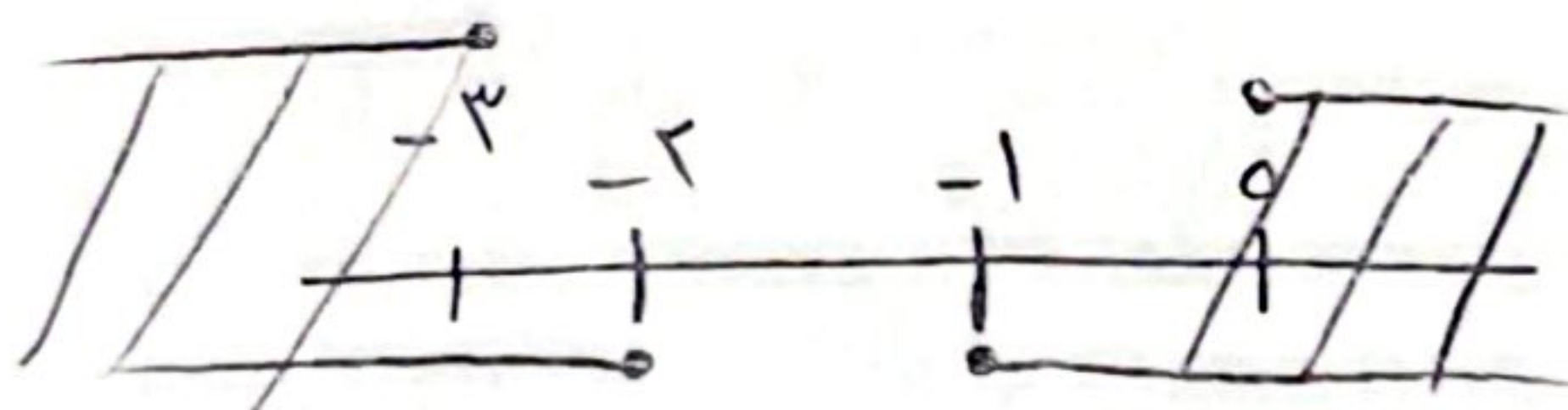


$$D_f = [2k\pi + \frac{\pi}{3}, (2k+1)\pi + \frac{2\pi}{3}]$$

(6)

①

الف) $-1 < x^2 + 3x + 1 \leq 1$



$D_f = (-\infty, -3] \cup [0, +\infty)$

$x^2 + 3x + 1 \leq -1$
 $x^2 + 3x + 2 \geq 0$
 $(x+1)(x+2) \geq 0$

$x^2 + 3x \leq 0$

ب) $0 < \sqrt{5-2x} \leq 1$

$0 \leq 5-2x \leq 1$
 $x \leq 2.5$ $2 \leq x$

$D_f = [2, 2.5]$

⑨

الف) $\log_r(1 - \log_r x) \rightarrow x > 0$

$1 \wedge 2 \rightarrow D_f = (0, 3)$

$1 - \log_r x > 0 \rightarrow \log_r x < 1 \rightarrow x < 3$

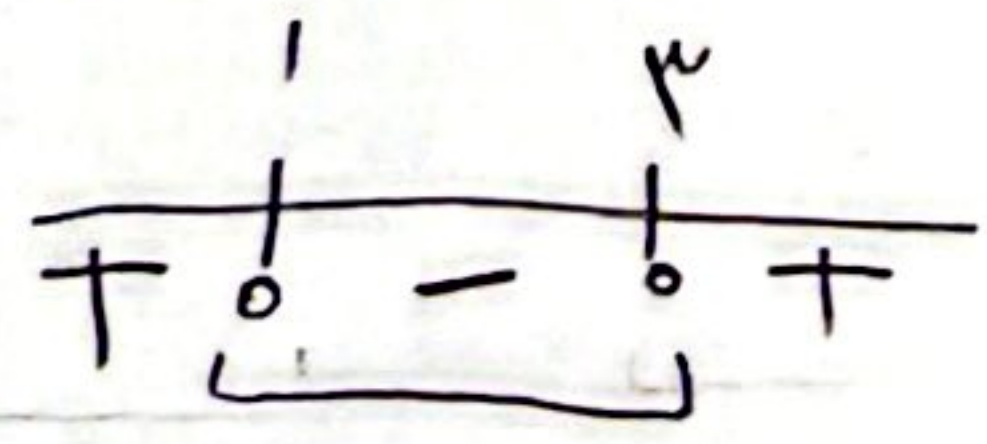
ب) $\log_r(1 - \log_{\frac{1}{r}} x) \rightarrow 1: x > 0$

$1 \wedge 2 \rightarrow D_f = (\frac{1}{r}, +\infty)$

$\rightarrow 2: \log_{\frac{1}{r}} x < 1 \rightarrow x > \frac{1}{r}$

الف)

$\frac{5x - x^2}{2} - 1 \geq 0$
 $\frac{5x - x^2}{2} \geq 1$
 $5x - x^2 \geq 2$
 $x^2 - 5x + 2 \leq 0$
 $(x-3)(x-1) \leq 0$



$D_f = [1, 3]$

ب) $\frac{3x+5}{2x+1} \in \mathbb{W}$

⑩

$3x+5 \in 2x\mathbb{W} + 1\mathbb{W}$
 $3x - 2x\mathbb{W} \in 1\mathbb{W} - 5$
 $\frac{x(3-2\mathbb{W})}{3-2\mathbb{W}} \in \frac{1\mathbb{W}-5}{3-2\mathbb{W}}$
 $x \in \frac{1\mathbb{W}-5}{3-2\mathbb{W}}$

$D_f = \{x \mid x = \frac{1k-5}{3-2k}, k \in \mathbb{W}\}$