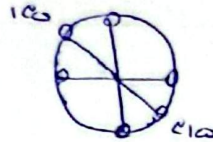


$$\frac{\cot x + 1}{\tan x + 1}$$

$$\Rightarrow \cos x \neq 0$$

$$\tan x \neq -1$$



$$R = \left\{ \frac{k\pi}{2}, k\pi - \frac{\pi}{4} \right\}$$

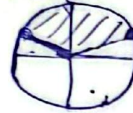
$$\sqrt{1 - \epsilon \sin^2 x} \Rightarrow 1 - \epsilon \sin^2 x \geq 0$$

$$\epsilon \sin^2 x \leq 1 \Rightarrow$$

$$-\frac{1}{\epsilon} \leq \sin x \leq \frac{1}{\epsilon}$$

$$\uparrow$$

$$\sin^2 x \leq \frac{1}{\epsilon}$$



$$\left[\frac{k\pi}{2} - \frac{\pi}{2}, \frac{k\pi}{2} + \frac{\pi}{2} \right]$$

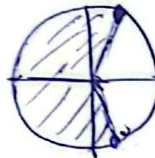
$$U \Rightarrow \text{union}$$

$$\left[\frac{k\pi}{2} - \frac{\pi}{2}, \frac{k\pi}{2} + \frac{\pi}{2} \right]$$

$$\left[\frac{k\pi}{2} + \frac{\pi}{2}, \frac{k\pi}{2} + \frac{3\pi}{2} \right]$$

$$\text{الف) } 1 - \epsilon \sin^2 x \geq 0 \Rightarrow \sin^2 x \geq \frac{1}{\epsilon}$$

$$\text{ب) } 1 - \epsilon \cos^2 x \geq 0 \Rightarrow \cos^2 x \leq \frac{1}{\epsilon}$$



$$R = \left(\frac{k\pi}{2} + \frac{\pi}{2}, \frac{k\pi}{2} + \frac{3\pi}{2} \right)$$

$$\text{ج) } -1 \leq x^2 + \epsilon x + 1 \leq 1 \xrightarrow{-1} -\epsilon \leq x^2 + \epsilon x \leq 0$$

$$\begin{array}{c} -\epsilon & -1 \\ + & - & + \\ \hline \end{array}$$

$$\begin{array}{l} \bullet \leq x^2 + \epsilon x + \epsilon \\ \bullet \leq (x+1)(x+\epsilon) \end{array}$$



$$\begin{array}{c} x^2 + \epsilon x \leq 0 \\ -\epsilon & 0 \\ + & - & + \\ \hline \end{array}$$

$$[-\epsilon, 0] \cup [0, \epsilon]$$

$$\text{د) } \cos y = \sqrt{\omega - \epsilon x} \xrightarrow{1} 0 - \epsilon x \geq 0 \Rightarrow x \leq 0$$

$$\xrightarrow{2} -1 \leq \sqrt{\omega - \epsilon x} \leq 1 \Rightarrow \omega - \epsilon x \leq 1 \Rightarrow \epsilon x \geq \omega - 1 \Rightarrow x \leq \frac{\omega - 1}{\epsilon}$$

$$\epsilon \leq x \leq \frac{\omega - 1}{\epsilon}$$

$$\log_r (1 - \log_p^x)$$

$$\Rightarrow 1 - \log_p^x > 0 \Rightarrow \log_p^x < 1 \Rightarrow x < \frac{1}{p}$$

$$\log_p (1 - \log_{\frac{1}{p}}^x)$$

$$\Rightarrow 1 - \log_{\frac{1}{p}}^x > 0 \Rightarrow \log_{\frac{1}{p}}^x < 1 \Rightarrow x < \frac{1}{p}$$

$$\text{الف) } \sqrt{\frac{\epsilon x - \alpha^2}{r - \epsilon}}$$

$$\Rightarrow \frac{\epsilon x - \alpha^2}{r - \epsilon} \geq 0 \Rightarrow \epsilon x - \alpha^2 \geq 0$$

$$\begin{array}{c} 1 & \epsilon \\ + & - & + \\ \hline \end{array}$$

$$\begin{array}{l} \bullet \leq x^2 - \epsilon x + \epsilon \\ \bullet \leq (x-1)(x-\epsilon) \end{array}$$

$$y = \frac{\epsilon x + \omega}{r x + \epsilon} \in W \Rightarrow r x W + \epsilon W = \epsilon x + \omega \Rightarrow$$

$$\begin{array}{l} r x W - \epsilon x = \omega - \epsilon W \\ x(r W - \epsilon) = \omega - \epsilon W \end{array}$$

$$\alpha = \frac{\omega - \epsilon W}{r W - \epsilon}$$

$$\alpha = \frac{\omega - \epsilon K}{r K - \epsilon} \mid K \in W$$

الف) $2x^2 + 3x - 8x + 3 \rightarrow 2x^2 + 3x - 8x + 3 \mid x-1$
 $2x^2 + 3x - 8x + 3 = 0 \Rightarrow x = \frac{-3 \pm \sqrt{9 + 16}}{4} \Rightarrow x = \frac{-3 \pm 5}{4}$
 $\Rightarrow x = \frac{1}{2}, -2$
 $\Rightarrow D = R - \left\{1, \frac{1}{2}, -2\right\}$

ب) $2x^2 + 9x + 10x + 3 \rightarrow 2x^2 + 19x + 3 \mid x+1$
 $2x^2 + 19x + 3 = 0 \Rightarrow x = \frac{-19 \pm \sqrt{361 - 24}}{4} \Rightarrow x = \frac{-19 \pm 19}{4}$
 $\Rightarrow x = -1, -\frac{3}{2}$
 $\Rightarrow D = R - \left\{-1, -\frac{3}{2}\right\}$

الف) $x^2 - 2x^2 + 2x - 1 = 0 \Rightarrow -x^2 + 2x - 1 = 0 \Rightarrow x^2 - 2x + 1 = 0$
 $\Rightarrow (x-1)^2 = 0 \Rightarrow x = 1$
 $\Rightarrow D = R - \{1\}$

ب) $\sqrt{\frac{x+3}{(x-1)(x^2-x+1)}} \Rightarrow \frac{x+3}{(x-1)(x^2-x+1)} \geq 0$
 $\Rightarrow \frac{x+3}{(x-1)(x^2-x+1)} \geq 0$

$x^2 - 5|x-1| - 2x + 5 = 0$
 $x > 0 \Rightarrow x^2 - 5(x-1) - 2x + 5 = 0 \Rightarrow x^2 - 7x + 10 = 0 \Rightarrow (x-2)(x-5) = 0 \Rightarrow x = 2, 5$
 $x < 0 \Rightarrow x^2 + 5(x-1) - 2x + 5 = 0 \Rightarrow x^2 + 3x = 0 \Rightarrow x(x+3) = 0 \Rightarrow x = 0, -3$

الف) $[-x] - 2 \geq 0 \Rightarrow [-x] \geq 2 \Rightarrow -x \geq 2 \Rightarrow x \leq -2$

ب) $y = \frac{5x^2 + 9}{[x]^2 + 2[x] - 3} \Rightarrow [x] = t \Rightarrow t^2 - 2t - 3 = 0 \Rightarrow (t-3)(t+1) = 0 \Rightarrow t = 3, -1$
 $3 \leq x < 4 \leftarrow [x] = 3 \quad [x] = -1 \rightarrow -1 \leq x < 0$
 $R - \left\{[3, 4) \cup [-1, 0)\right\}$

$\sqrt{\left[x - \frac{1}{2}\right] + \left[\frac{x}{2}\right]} \geq 0 \Rightarrow \left[x - \frac{1}{2}\right] + \left[\frac{x}{2}\right] + 1 \geq 0$
 $2\left[x - \frac{1}{2}\right] \geq -1 \Rightarrow \left[x - \frac{1}{2}\right] \geq -\frac{1}{2} \Rightarrow x - \frac{1}{2} \geq 0 \Rightarrow x \geq \frac{1}{2}$
 $\Rightarrow x = \frac{1}{2} + k, k \in \mathbb{Z}$
 $\Rightarrow \{x = \frac{1}{2} + k \mid k \in \mathbb{Z}\}$