

أ) $\frac{x+3}{(x-1)(2x^2+5x-3)} = \frac{x+3}{(x-1)(x-\frac{1}{2})(x+3)}$

$R = \{1, \frac{1}{2}, -3\}$

①

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

أ) $\frac{x+3}{(x-1)(x^2-x+1)} \rightarrow R = \{1\}$

②

ب) $\sqrt{\frac{x+3}{(x-1)(x^2-x+1)}} \rightarrow \frac{-3}{+3-3} R = (-3, 1]$

$x^2 - \omega(x-1) - 2x + \omega \neq 0$

③

$\begin{cases} x > 1 \rightarrow x^2 - \omega x + \omega - 2x + \omega = 0 \rightarrow x^2 - 2x + 2\omega = 0 \rightarrow \frac{(x-1)(x-2\omega)}{1} = 0 \\ x < 1 \rightarrow x^2 + \omega x - \omega - 2x + \omega = 0 \rightarrow x^2 - x = 0 \rightarrow \frac{x(x-1)}{1} = 0 \end{cases}$

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

أ) $[-x] - 2 > 0 \rightarrow [-x] > 2 \rightarrow -x > 2, x < -2 \rightarrow (-\infty, -2]$

④

ب) $[x]^2 - 2[x] - 3 \neq 0 \xrightarrow{[x]=t} t^2 - 2t - 3 \neq 0 \rightarrow \frac{(t+1)(t-3)}{1}$

$[x] = 3 \rightarrow 3 < x < 4 \quad [x] = -1 \rightarrow -1 < x < 0 \rightarrow (-\infty, -1) \cup (0, 3) \cup (3, 4) \rightarrow R = ([-1, 0) \cup [3, 4))$

أ) $[x - \frac{1}{x}] + [x + \frac{x}{x}] > 0 \rightarrow x[x + \frac{x}{x}] - 1 > 0 \rightarrow [x + \frac{x}{x}] > \frac{1}{x} \rightarrow x + \frac{x}{x} > 1 \rightarrow x > \frac{1}{x} \rightarrow [\frac{1}{x}, +\infty)$

⑤

ب) $[x - \frac{1}{x}] + [\frac{1}{x} - x] \xrightarrow{[x] + [x]} \begin{matrix} \in \mathbb{Z} \rightarrow 0 \\ \notin \mathbb{Z} \rightarrow -1 \end{matrix} \rightarrow \{x \mid x = k + \frac{1}{x}, k \in \mathbb{Z}\}$

أ) $\sin x \neq 0 \rightarrow R = \pi, 2\pi$

$\tan x + 1 \neq 0 \rightarrow \tan x \neq -1 \rightarrow R = \frac{\pi}{4}, \frac{5\pi}{4} \rightarrow R = \{2k\pi + \frac{\pi}{4}, 2k\pi + \frac{5\pi}{4} \mid k \in \mathbb{Z}\}$

⑥

$\cos x \neq 0 \rightarrow R = \frac{\pi}{2}, \frac{3\pi}{2}$

ب) $1 - \epsilon \sin x > 0 \rightarrow \epsilon \sin x < 1 \rightarrow \sin x < \frac{1}{\epsilon} \rightarrow \frac{1}{\epsilon} < \sin x < \frac{1}{\epsilon} \rightarrow [\frac{\pi}{4}, \frac{3\pi}{4}] \cup [\frac{5\pi}{4}, \frac{7\pi}{4}]$

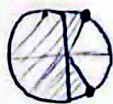
أ) $2 \sin x > 1 \rightarrow \sin x > \frac{1}{2}$



$[2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}]$

⑦

ب) $1 - 2 \cos x > 0 \rightarrow \cos x < \frac{1}{2}$



$[2k\pi + \frac{2\pi}{3}, 2k\pi + \frac{4\pi}{3}]$

الف) $-\frac{1}{2}x^2 + x + 1 < 0 \rightarrow x^2 - 2x - 2 > 0 \rightarrow (x+1)(x-3) \rightarrow \frac{-1 \pm \sqrt{1+8}}{2} \rightarrow \frac{-1 \pm 3}{2}$



ج) $-\frac{1}{2}\sqrt{5-2x} < 1 \rightarrow \sqrt{5-2x} < 2 \rightarrow 0 < 5-2x < 4 \rightarrow -1 < -2x < -1 \rightarrow 1 < x < 2 \rightarrow [1, 2]$

الف) $1 - \log_2 x > 0 \rightarrow \log_2 x < 1 \rightarrow x < 2 \rightarrow (0, 2)$

ب) $1 - \log_2 \frac{x}{2} > 0 \rightarrow \log_2 \frac{x}{2} < 1 \rightarrow x < \frac{1}{2} \rightarrow (\frac{1}{2}, +\infty)$

الف) $x^2 - x^2 - 8 > 0 \rightarrow 8 > 0 \rightarrow x^2 < 8 \rightarrow x < \sqrt{8} \rightarrow x^2 - x^2 \rightarrow x^2 - 8x + 16 < 0$

$\rightarrow (x-2)(x-1) < 0 \rightarrow \frac{1}{x-2} > 0 \rightarrow [1, 2]$

ب) $\frac{x^2 + \omega}{x^2 + \epsilon} \in \omega \rightarrow x = -\frac{\epsilon\omega - \omega}{\omega - \epsilon} \rightarrow \{x \mid x = \frac{\epsilon K - \omega}{\epsilon - \epsilon K}, K \in \omega\}$