

الف) $2x^3 - 3x^2 - 11x + 2 \neq 0 \Rightarrow (x-1)(2x^2 + 5x - 3) \neq 0 \Rightarrow (x-1)(x+3)(2x-1) \neq 0$ $x \in \mathbb{R} - \{-\frac{3}{2}, -\frac{1}{2}, \frac{1}{2}\}$

ب) $2x^3 + 9x^2 + 10x + 2 \neq 0 \Rightarrow (x+1)(2x^2 + 7x + 2) \neq 0 \Rightarrow (x+1)(2x+1)(x+2) \neq 0$ $\Rightarrow x \in \mathbb{R} - \{-1, -\frac{1}{2}, -2\}$

الف) $x^3 - 2x^2 + 2x - 1 \neq 0 \Rightarrow (x^3 - x^2) + (-x^2 + x) + (x - 1) = x^2(x-1) - x(x-1) + (x-1) = (x-1)(x^2 - x + 1) \neq 0$

$(x-1)(x^2 - x + 1) \neq 0 \Rightarrow \Delta < 0 \Rightarrow x \neq 1$ $x \in \mathbb{R} - \{1\}$

ب) $x^3 - 2x^2 + 2x - 1 \neq 0 \Rightarrow \frac{(x+2) \rightarrow -2}{(x-1)(x^2 - x + 1)} \geq 0 \Rightarrow \frac{-2}{+0} \quad \frac{1}{-0} \quad +$
 $\Rightarrow x \in \mathbb{R} - [-2, 2)$

$x^2 - 5|x-1| - 11x + 5 \neq 0$
 $\begin{cases} x \leq 1 \Rightarrow x^2 + 4x \Rightarrow x(x+4) \Rightarrow x = -4 \text{ و } x = 0 \checkmark \\ x \geq 1 \Rightarrow x^2 - 6x + 10 \Rightarrow (x-3)(x-2) \Rightarrow x = 2 \text{ و } x = 3 \checkmark \end{cases}$
 $\Rightarrow x \in \mathbb{R} - \{0, 5, 2\}$

الف) $\sqrt{[-x]-2} \neq 0 \Rightarrow [-x]-2 \geq 0 \quad [-x] \geq 2 \Rightarrow x \leq -2$

ب) $[x]^2 - 2[x] - 3 \neq 0 \Rightarrow ([x]-3)([x]+1) \neq 0 \Rightarrow [x] \neq 3 \text{ و } [x] \neq -1$
 $[x] \neq -1 \Rightarrow x \notin [-1, 0)$

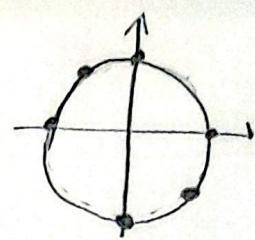
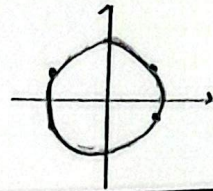
الف) $[x - \frac{1}{4}] + [x + \frac{1}{4}] \geq 0 \Rightarrow [x - \frac{1}{4} + 1] + [x + \frac{1}{4}] - 1 \geq 0 \Rightarrow 2[x + \frac{1}{4}] - 1 \geq 0$

$[x + \frac{1}{4}] \geq \frac{1}{2} \Rightarrow x + \frac{1}{4} \geq 1 \Rightarrow x \geq \frac{3}{4}$

ب) $[x - \frac{1}{4}] + [\frac{1}{4} - x] \neq 0 \Rightarrow x - \frac{1}{4} \in \mathbb{R} \Rightarrow x \in \mathbb{Z} + \frac{1}{4} \quad x \in \{k + \frac{1}{4} \mid k \in \mathbb{Z}\}$

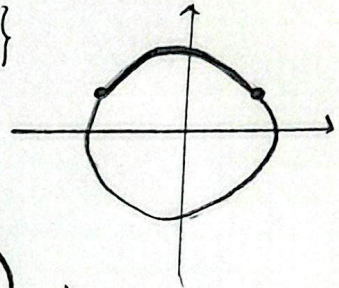
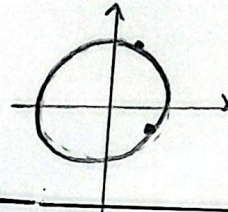
الف) $\frac{\cot x + 1}{\tan x + 1} = 0 \Rightarrow \tan x = 0 \Rightarrow x = \left\{ \frac{k\pi}{r}, k\pi - \frac{\pi}{r} \right\}$

ب) $1 - r \sin x \geq 0 \Rightarrow \frac{1}{r} \geq \sin x \Rightarrow -\frac{1}{r} \leq \sin x \leq \frac{1}{r}$
 $\Rightarrow x \in \left[k\pi - \frac{\pi}{r}, k\pi + \frac{\pi}{r} \right]$



الف) $r \sin x - 1 \geq 0 \Rightarrow \sin x \geq \frac{1}{r} \Rightarrow x \in \left[r k \pi + \frac{\pi}{r}, r k \pi + \frac{\pi}{r} \right]$

ب) $1 - r \cos x \geq 0 \Rightarrow \frac{1}{r} \geq \cos x \Rightarrow x \in \left[r k \pi + \frac{\pi}{r}, r k \pi + \frac{\pi}{r} \right]$



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

$0 \leq x^2 + 3x + 1 \Rightarrow 0 \leq (x+1)(x+1) \Rightarrow x \in [-r, -r] \cup [-1, 0]$

ب) $\cos y = \sqrt{a - rx} \Rightarrow -1 \leq \sqrt{a - rx} \leq 1 \Rightarrow a - rx \geq 0 \Rightarrow x \leq \frac{a}{r}$
 $\sqrt{a - rx} \leq 1 \Rightarrow a - rx \leq 1 \Rightarrow r \leq rx \Rightarrow r \leq x \Rightarrow x \leq r, a$

الف) $y = \log_r (1 - \log_r x)$ $x > 0$
 $1 - \log_r x > 0 \Rightarrow 1 > \log_r x \Rightarrow 0 < x < r$

ب) $y = \log_r (1 - \log_r \frac{x}{r})$
 $\Rightarrow \begin{cases} x > 0 \\ 1 - \log_r \frac{x}{r} > 0 \end{cases} \Rightarrow 1 > \log_r \frac{x}{r} \Rightarrow \frac{1}{r} > \frac{x}{r} \Rightarrow 0 < x < \frac{1}{r}$

الف) $\sqrt{r^x - x^r} - 1 \Rightarrow r^x - x^r - 1 \geq 0 \Rightarrow r^x - x^r \geq 1 \Rightarrow 0 \geq x - r^x$
 $0 \geq (x - r)(x - 1) \Rightarrow x \in [1, r]$

ب) $y = \left(\frac{r^x + a}{r^x + r} \right)!$ $\frac{r^x + a}{r^x + r} \in W \Rightarrow x \in -\frac{r\omega - a}{r\omega - r}$
 $\Rightarrow x \in \left\{ -\frac{rk - a}{rk - r} \mid k \in W \right\}$