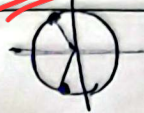
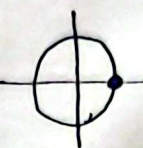
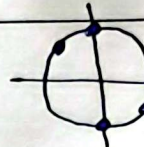
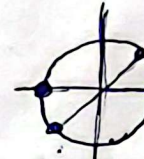


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الف) $2\cos x + 1 \neq 0 \Rightarrow 2\cos x \neq -1 \Rightarrow \cos x \neq -\frac{1}{2}$  $R - \left\{ 2k\pi + \frac{2\pi}{3}, 2k\pi + \frac{4\pi}{3} \right\}$

ب) $\cos x - 1 \neq 0 \Rightarrow \cos x \neq 1 \Rightarrow$  $R - \{ 2k\pi \}$

الف) $\tan x + 1 \neq 0 \Rightarrow \tan x \neq -1$
 $\cos x \neq 0 \Rightarrow$  $R - \left\{ k\pi - \frac{\pi}{4}, k\pi + \frac{3\pi}{4} \right\}$

ب) $\cot x - 1 \neq 0 \Rightarrow \cot x \neq 1$
 $\sin x \neq 0 \Rightarrow$  $R - \left\{ k\pi, k\pi + \frac{\pi}{2} \right\}$

الف) $-1 \leq x^2 - 2 \leq 1 \xrightarrow{+2} 1 \leq x^2 \leq 3 \Rightarrow \begin{matrix} 1 \leq x \leq \sqrt{3} \\ -1 \leq x \leq -\sqrt{3} \end{matrix}$

ب) $x \geq 0$
 $-1 \leq \sqrt{x} - 3 \leq 1 \xrightarrow{+3} 2 \leq \sqrt{x} \leq 4 \Rightarrow 4 \leq x \leq 16$ $\Rightarrow Df = [4, 16]$

الف) $-1 \leq |x| - 2 \leq 1 \xrightarrow{+2} 2 \leq |x| \leq 3 \Rightarrow \begin{matrix} 2 \leq x \leq 3 \\ -3 \leq x \leq -2 \end{matrix}$

ب) $-1 \leq x^2 + 3x + 1 \leq 1$
 $\begin{cases} x^2 + 3x \leq 0 \Rightarrow x(x+3) \leq 0 \Rightarrow x \in [-3, 0] \\ 0 \leq x^2 + 3x + 2 \Rightarrow (x+1)(x+2) \geq 0 \Rightarrow x \in (-\infty, -2] \cup [-1, \infty) \end{cases}$
 $\Rightarrow Df = [-3, -2] \cup [-1, 0]$

الف) $x^2 - 4 > 0 \Rightarrow x^2 > 4 \Rightarrow x > 2 \vee x < -2$
 $\Rightarrow Df = (-\infty, -2) \cup (2, \infty)$

ب) $2 - |x| > 0 \Rightarrow 2 > |x| \Rightarrow 2 > x > -2 \text{ or } (-2, 2)$

الف) $\omega - x > 0 \Rightarrow x < \omega$
 $x - r > 0 \Rightarrow x > r$
 $x \neq r$
 $\Rightarrow Df = (r, \omega) - \{r\}$ ✓

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ب) $x^r - 1 > 0 \Rightarrow x^r > 1 \Rightarrow x > 1 \vee x < -1 \Rightarrow$ ~~$\frac{0}{-r-1}$~~ ~~$\frac{0}{1}$~~ $Df = (-r, -1) \cup (1, \infty) - \{-r\}$ ✓

الف) $\frac{x^r - rx + r}{x-r} > 0 \Rightarrow \frac{(x-1)(x-r)}{x-r}$ $x < r$ $\frac{1}{r(r)} | - | + | +$ $(1, r) \cup (r, \infty)$ ✓

1, 100

ب) $\frac{x+r}{x-r} > 0$ $x < \frac{-r}{r}$ $\frac{1}{r(r)} | + | - | +$ $(-r, -r) \cup (r, \infty)$
 $\Rightarrow Df = (-r, -r) \cup (r, \infty) - \{-r\}$ ✓

الف) $x - r > 0 \Rightarrow x > r$ $r = \log_r x^{-r} > 0 \Rightarrow \log_r x^{-r} \leq r \Rightarrow x^{-r} \leq r \Rightarrow x \leq \sqrt[r]{r}$
 $\hookrightarrow Df = [r, b]$

1, 100

ب) $(x > 0) \Rightarrow r \log_r x - 1 > 0 \Rightarrow r \log_r x > 1 \Rightarrow \log_r x > \frac{1}{r} \Rightarrow x > \sqrt[r]{r}$
 $Df = x > \sqrt[r]{r} \Rightarrow (\sqrt[r]{r}, \infty)$ ✓

الف) $r^x \neq -1 \Rightarrow Df = \mathbb{R}$ ✓

ب) $r^x \neq +1 \Rightarrow x \neq 0 \Rightarrow Df = \mathbb{R} - \{0\}$ ✓

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ج) $r^x \neq r \Rightarrow x \neq \log_r r \Rightarrow Df = \mathbb{R} - \log_r r$ ✓

د) $r^x \neq r \Rightarrow x \neq \log_r r \Rightarrow Df = \mathbb{R} - \log_r r$ ✓

الف) $f(x+1) \in W \Rightarrow x = \frac{w-1}{r} \Rightarrow \{x \mid \frac{k-1}{r}, k \in W\}$ ✓

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ب) $\frac{r^x - r}{r^x - 1} \in W \Rightarrow r^x W - \omega W = r^x - 1 \Rightarrow r^x W - r^x = \omega W - r$
 $x(rW - r) = \omega W - r$
 $\hookrightarrow x \neq \frac{\omega W - r}{rW - r}$ ✓