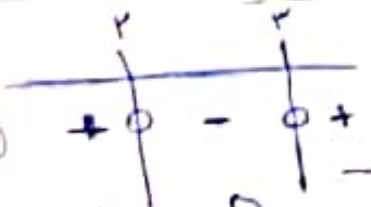


1

✓

الف) $x^2 - 5x + 6 > 0 \Rightarrow (x-2)(x-3) > 0$

$(-\infty, 2) \cup (3, +\infty)$



2

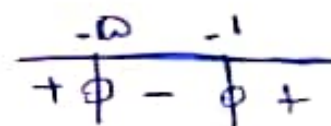
ب) $x^2 - 6x + 5 < 0 \Rightarrow (x-1)(x-5) < 0$

$(1, 5)$



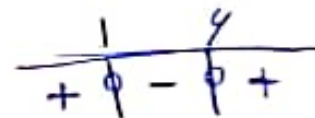
ج) $x^2 + 4x + 5 \geq 0 \Rightarrow (x+1)(x+5) \geq 0$

$[-5, -1] \cup [1, +\infty)$



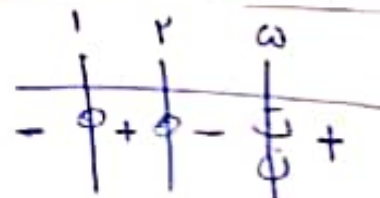
د) $x^2 - 5x + 4 \leq 0 \Rightarrow (x-1)(x-4) \leq 0$

$[1, 4]$



الف) $\frac{x^2 - 3x + 2}{x-5} < 0 \Rightarrow \frac{(x-2)(x-1)}{x-5} < 0$

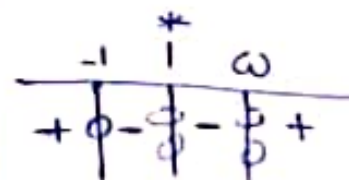
$(-\infty, 1) \cup (2, 5)$



3

ب) $\frac{x^2 - 1}{x^2 - 4x + 5} \geq 0 \Rightarrow \frac{(x-1)(x+1)}{(x-1)(x-5)} \geq 0$

$[-\infty, -1] \cup (5, +\infty)$



الف) $y = \sqrt{\frac{x^2-1}{x^2-x}} \Rightarrow \frac{(x-1)(x^2+x+1)}{x(x-1)(x+1)} \geq 0$ (ف)

$\frac{-1 \quad 0 \quad 1}{+ \quad - \quad +}$

$D_f = \left\{ \begin{array}{l} (-\infty, -1) \cup (0, 1) \\ \cup (1, +\infty) \end{array} \right\}$

ب) $y = \sqrt{\frac{x^2-1}{x^2-\omega x+f}} \Rightarrow \frac{(x-f)(x+f)}{(x-1)(x-f)} \geq 0$ *

$\frac{-f \quad +1 \quad f}{+ \quad - \quad +}$

Ⓟ ✓

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

الف) $y = \sqrt{f - \sqrt{r-x}} \Rightarrow f - \sqrt{r-x} \geq 0$ (ع)

$\Rightarrow r-x \geq 0 \Rightarrow x \leq r$ Ⓟ ✓

$\sqrt{r-x} \leq f \Rightarrow r-x \leq f^2 \Rightarrow x \geq -1f$

$\Rightarrow -1f \leq x \leq r \Rightarrow D_f = [-1f, r]$

ب) $y = \sqrt{r - \sqrt{x-r}} \Rightarrow r - \sqrt{x-r} \geq 0 \Rightarrow \sqrt{x-r} \leq r \Rightarrow x-r \leq r^2 \Rightarrow x \leq 11$

$x-r \geq 0 \Rightarrow x \geq r$

$r \leq x \leq 11 \Rightarrow D_f = [r, 11]$

الف) $y = \sqrt{f - r x^2} \Rightarrow f - r x^2 \geq 0 \Rightarrow r x^2 \leq f \Rightarrow x^2 \leq \frac{f}{r}$ (ق)

$\Rightarrow -\sqrt{\frac{f}{r}} \leq x \leq \sqrt{\frac{f}{r}}$ (فرضاً $r > 0$)

$D_f = \left[-\sqrt{\frac{f}{r}}, \sqrt{\frac{f}{r}} \right]$

ب) $y = \sqrt{r|x|-9} \Rightarrow r|x|-9 \geq 0 \Rightarrow r|x| \geq 9 \Rightarrow |x| \geq \frac{9}{r} \Rightarrow x \leq -\frac{9}{r} \text{ or } x \geq \frac{9}{r}$

$D_f = (-\infty, -\frac{9}{r}] \cup [\frac{9}{r}, +\infty)$ Ⓟ ✓

$$\text{a)} y = \sqrt{\frac{|a|+1}{|a|-r}} \Rightarrow |a|-r \neq 0 \Rightarrow |a| \neq +r \Rightarrow a \neq r, -r$$

$$D_f = (-\infty, -r) \cup (-r, r) \cup (r, +\infty)$$

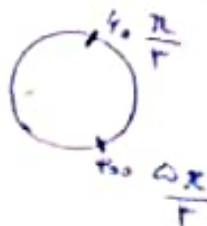
(v) ✓

$$\text{b)} \sqrt{\frac{\sqrt{a}+1}{\sqrt{a}-r}} \Rightarrow \sqrt{a} \geq 0 \Rightarrow a \geq 0$$

$$\sqrt{a}-r \neq 0 \Rightarrow \sqrt{a} \neq r \Rightarrow a \neq r^2$$

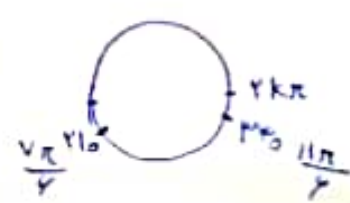
$$D = [0, r^2) \cup (r^2, +\infty)$$

$$\text{a)} y = \frac{\sin a}{r \cos a - 1} \Rightarrow r \cos a - 1 \neq 0 \Rightarrow r \cos a \neq 1 \Rightarrow \cos a \neq \frac{1}{r}$$

$$D_f = \mathbb{R} - \left\{ \frac{\pi}{r} + k\pi, \frac{\omega\pi}{r} + k\pi \right\}$$


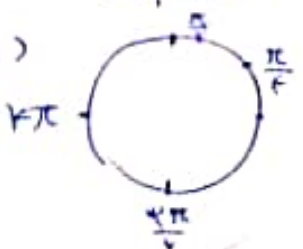
(u)

$$\text{b)} y = \frac{\cos a + 1}{r \sin a + 1} \Rightarrow r \sin a + 1 \neq 0 \Rightarrow \sin a \neq -\frac{1}{r}$$

$$D_f = \mathbb{R} - \left\{ r k\pi + \frac{v\pi}{r}, r k\pi + \frac{11\pi}{r} \right\}$$


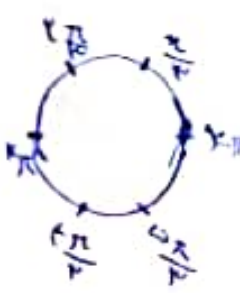
$$\text{c)} y = \frac{\tan a + r}{\cot a - 1} \Rightarrow \frac{\cos a}{\sin a} - 1 \neq 0 \Rightarrow \frac{\cos a}{\sin a} \neq 1 \Rightarrow \sin a \neq \cos a \Rightarrow a \neq \frac{\pi}{4} + k\pi$$

$$\Rightarrow \left. \begin{array}{l} \tan a = \frac{\sin a}{\cos a} \Rightarrow \cos a \neq 0 \\ \cot a = \frac{\cos a}{\sin a} \Rightarrow \sin a \neq 0 \end{array} \right\} \begin{array}{l} a \neq \frac{\pi}{2} + k\pi \\ a \neq k\pi \end{array}$$

$$D_f = \mathbb{R} - \left\{ k\pi, \frac{\pi}{4} + k\pi, k\pi + \frac{\pi}{4} \right\}$$


$$\text{d)} y = \frac{\sin a + 1}{r \sin a - r} \Rightarrow r \sin a - r \neq 0 \Rightarrow r \sin a \neq r \Rightarrow \sin a \neq \frac{r}{r} \Rightarrow \sin a \neq 1$$

$$r \sin a - r = 0 \Rightarrow \sin a = \frac{r}{r} \Rightarrow \sin a = \pm \frac{r}{r}$$

$$D_f = \mathbb{R} - \left\{ \frac{\pi}{r} + k\pi, \frac{r\pi}{r} + k\pi \right\}$$


(v) ✓

$$y = \frac{1}{\sqrt{r|a-r| - \frac{1}{r}}} \Rightarrow r|a-r| - \frac{1}{r} > 0 \Rightarrow r|a-r| > \frac{1}{r}$$

$$\Rightarrow |a-r| > \frac{1}{r} \Rightarrow a-r > \frac{1}{r} \quad a > \frac{r+1}{r}$$

$$a-r > -\frac{1}{r} \Rightarrow a < \frac{r-1}{r}$$

$$D = (-\infty, \frac{r-1}{r}) \cup (\frac{r+1}{r}, +\infty)$$

Ⓟ ✓

$$a) y = \sqrt{r - r|a|} \Rightarrow r - r|a| \geq 0 \Rightarrow -r|a| \geq -r \Rightarrow |a| \leq 1$$

$$\Rightarrow -1 \leq a \leq 1 \Rightarrow D = [-1, 1]$$

$$b) y = \sqrt{\frac{|a|}{|a|}} \Rightarrow |a| \neq 0 \Rightarrow a \neq 0 \Rightarrow D = \mathbb{R} - \{0\}$$

Ⓟ ✓