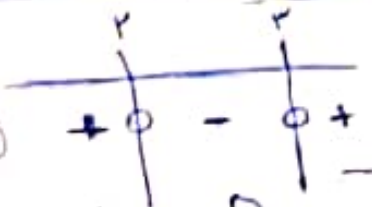


1

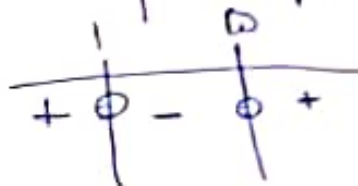
الف) $x^2 - 5x + 6 > 0 \Rightarrow (x-2)(x-3) > 0$

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



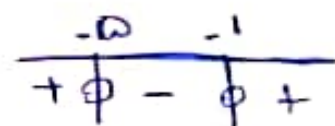
ب) $x^2 - 5x + 4 < 0 \Rightarrow (x-1)(x-4) < 0$

$(1, 4)$



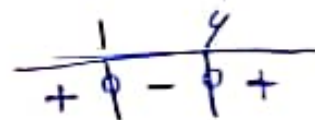
ج) $x^2 + 5x + 4 \geq 0 \Rightarrow (x+1)(x+4) \geq 0$

$[-4, -1] \cup [-\infty, -1] \cup [4, +\infty]$



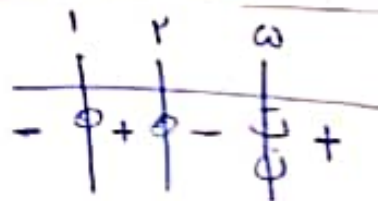
د) $x^2 - 5x + 4 \leq 0 \Rightarrow (x-1)(x-4) \leq 0$

$[1, 4]$



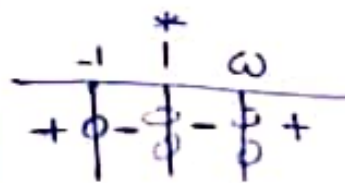
الف) $\frac{x^2 - 3x + 2}{x-1} < 0 \Rightarrow \frac{(x-2)(x-1)}{x-1} < 0$

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



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

$(-\infty, -1] \cup (2, +\infty)$



2

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

$D_f = \left\{ (-\infty, -1) \cup (0, 1) \right\}$
 $V(1, +\infty)$

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

(F)

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

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

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

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

$\Rightarrow r-x \geq 0$

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

$\boxed{x \leq r} \Rightarrow -1f \leq x \leq r \Rightarrow D = [-1f, r]$

(G)

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

$x-r \geq 0 \Rightarrow x \geq r \Rightarrow D = [r, 11]$

$r \leq x \leq 11$

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

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

(H)

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

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

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

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

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

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

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

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

$$\Rightarrow \cos a \neq \frac{1}{r}$$

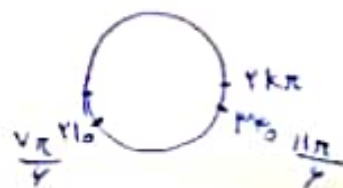
$$D_f = \mathbb{R} - \left\{ \frac{\pi}{r} + 2k\pi, \frac{2\pi}{r} + 2k\pi \right\}$$



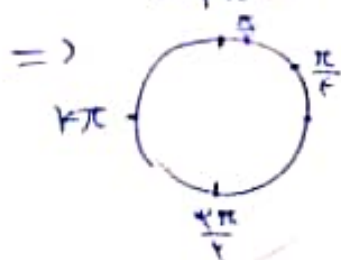
①

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

$$D_f = \mathbb{R} - \left\{ 2k\pi + \frac{3\pi}{2}, 2k\pi + \frac{5\pi}{2} \right\}$$



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



$$\tan a = \frac{\sin a}{\cos a} \Rightarrow \cos a \neq 0$$

$$\cot a = \frac{\cos a}{\sin a} \Rightarrow \sin a \neq 0$$

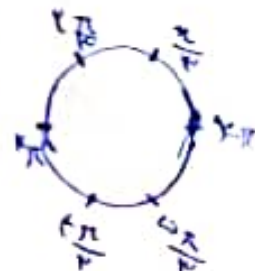
$$\left. \begin{array}{l} a \neq \frac{\pi}{2} + k\pi \\ a \neq k\pi \end{array} \right\}$$

$$D_f = \mathbb{R} - \left\{ k\pi, \frac{\pi}{2} + k\pi, k\pi + \frac{\pi}{2} \right\}$$

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

$$r \sin a - r = 0 \Rightarrow \sin a = \frac{r}{r} \Rightarrow \sin a = 1 \Rightarrow a = \frac{\pi}{2} + 2k\pi$$

$$D_f = \mathbb{R} - \left\{ \frac{\pi}{2} + 2k\pi, \frac{3\pi}{2} + 2k\pi \right\}$$



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

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

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

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

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

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

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