

سوال ۱) الف) $y = \sqrt{\frac{x^2 - 4x}{x^2 - x}} = 1, \frac{x(x-4)}{x(x-1)} \geq 0 \Rightarrow$

ب) $y = \sqrt{\frac{x^2 - x^2}{x^2 - x}} \Rightarrow \frac{x^2(x-1)}{x(x-1)} \neq 0 \Rightarrow$

سوال ۲) الف) $y = \frac{x+1}{\sqrt{x+|x|}} \Rightarrow x+|x| > 0 \Rightarrow x < 0 \Rightarrow x+|x| = x-x = 0$

ب) $y = \frac{1}{\sqrt{x|x|}} \Rightarrow x|x| > 0 \Rightarrow x > 0 \Rightarrow x^2 > 0$

سوال ۳) الف) $y = \sqrt{2-[x]} \Rightarrow 2-[x] \geq 0 \Rightarrow [x] \leq 2 \Rightarrow x < 3$

ب) $y = \frac{1}{\sqrt{2-[x]}} \Rightarrow 2-[x] > 0 \Rightarrow [x] < 2 \Rightarrow D = (-\infty, 2)$

سوال ۴) الف) $y = \sqrt{\left[x - \frac{1}{x}\right] + \left[x + \frac{1}{x}\right]} = \left[x - \frac{1}{x}\right] + \left[x + \frac{1}{x}\right] \geq 0 \Rightarrow x < \frac{1}{x}$

$D = \left[\frac{1}{x} + \infty\right) \quad \leftarrow \begin{matrix} \text{منفی است} \\ \text{مثبت} \end{matrix}$

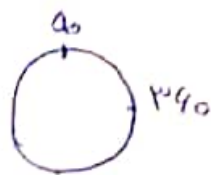
ب) $y = \sqrt{\left[x - \frac{1}{x}\right] + \left[-x + \frac{1}{x}\right]} \Rightarrow \beta = x - \frac{1}{x} \Rightarrow [B] + [-B] \Rightarrow \begin{matrix} t \in \mathbb{Z} \\ t \notin \mathbb{Z} \end{matrix}$

$= \left\{ \frac{1}{x} + n \mid n \in \mathbb{Z} \right\} \quad \leftarrow x - \frac{1}{x} \in \mathbb{Z} \quad \leftarrow \text{باید بتواند باشد}$

$$y = \frac{r}{\sin \theta - 1} \Rightarrow \sin \theta - 1 \neq 0 \Rightarrow \sin \theta \neq 1$$

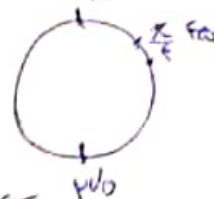
سوال ٥

$$\theta = \frac{\pi}{r} + 2k\pi \Rightarrow D = \mathbb{R} - \left\{ \frac{\pi}{r} + 2k\pi \right\}$$



$$b) y = \frac{r}{r \sin^2 \theta - 1} \Rightarrow r \sin^2 \theta - 1 \neq 0 \Rightarrow \sin^2 \theta \neq \frac{1}{r} \Rightarrow \sin \theta \neq \pm \frac{1}{\sqrt{r}}$$

$$\Rightarrow \theta = \frac{\pi}{\sqrt{r}} + \frac{k\pi}{\sqrt{r}} \Rightarrow D = \mathbb{R} - \left\{ \frac{\pi}{\sqrt{r}} + \frac{k\pi}{\sqrt{r}} \right\}$$



$\{a_0, r a_0\} \subset \mathbb{R}$

$$c) y = \sqrt{r \sin \theta - 1} \Rightarrow r \sin \theta - 1 \geq 0 \Rightarrow \sin \theta \geq \frac{1}{r} \Rightarrow \frac{\pi}{r} \leq \theta \leq \frac{5\pi}{r}$$

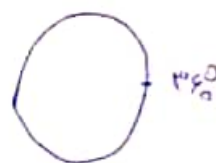
سوال ٦

$$D = \left[\frac{\pi}{r} + 2k\pi, \frac{5\pi}{r} + 2k\pi \right]$$



$$b) y = \sqrt{4 \cos \theta - 1} \Rightarrow 4 \cos \theta - 1 \geq 0 \Rightarrow \cos \theta \geq \frac{1}{4} \Rightarrow \cos \theta = 1 \Rightarrow D = \{2k\pi\}$$

$\cos \theta = 1$
 $\downarrow$
 $\theta = 2k\pi$



سوال ٧

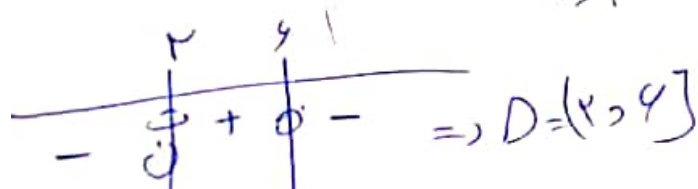
$$a) \cos y = |x| - r \Rightarrow -1 \leq |x| - r \leq 1 \Rightarrow r \leq |x| \leq r+1 \Rightarrow D = [-r-1, -r] \cup [r, r+1]$$

$$b) y = \arcsin(x^2 + 2x + 1) \Rightarrow -1 \leq x^2 + 2x + 1 \leq 1 \Rightarrow -1 \leq (x+1)^2 \leq 1$$

$$\Rightarrow (x+1)^2 \geq 0 \Rightarrow -1 \leq x+1 \leq 1 \Rightarrow -2 \leq x \leq 0 \Rightarrow D = [-2, 0]$$

سوال ٨

$$a) y = \sqrt{r - \log_r(x-r)} \Rightarrow x-r > 0 \Rightarrow x > r \Rightarrow r - \log_r(x-r) \geq 0 \Rightarrow \log_r(x-r) \leq r \Rightarrow x-r \leq r^r \Rightarrow x \leq r+r^r \Rightarrow D = (r, r+r^r]$$



Subject:

① $\frac{1}{x}$

$$b) y = \log(a^x - a) \Rightarrow a^x - a > 0 \\ \Rightarrow a(a^{x-1} - 1) > 0$$

$$+ \frac{0}{1} - \frac{1}{0} + \Rightarrow D = (-\infty, 0) \cup (1, +\infty)$$

④ $\frac{1}{x^2}$

$$a) y = \frac{x}{x^2 + 1} \Rightarrow x^2 + 1 \neq 0 \\ \Rightarrow x^2 \neq -1 \Rightarrow \text{دائم} \Rightarrow D = \mathbb{R}$$

$$b) y = \frac{x}{x^2 - 1} \Rightarrow x^2 - 1 \neq 0 \\ \Rightarrow x^2 \neq 1 \Rightarrow x \neq \pm 1 \Rightarrow D = \mathbb{R} - \{\pm 1\}$$

$$c) y = \frac{x}{x^2 - x} \Rightarrow \begin{matrix} x^2 - x \neq 0 \\ x^2 \neq x \end{matrix} \Rightarrow x \neq \log_f x \Rightarrow x^{\frac{1}{x}} = x \Rightarrow x \neq \frac{1}{x}$$

$$\Rightarrow D = \mathbb{R} - \left\{ \frac{1}{x} \right\}$$

$$d) y = \frac{x}{x^2 - x} \Rightarrow \begin{matrix} x^2 \neq x \\ x^2 - x \neq 0 \end{matrix} \Rightarrow x \neq \log_f x$$

$$\Rightarrow D = \mathbb{R} - \{ \log_f x \}$$

IDEA

$$a) y = (fa+1)! \Rightarrow fa+1 \in \mathbb{N}$$

سوال 10

$$\Rightarrow fa+1 = n \Rightarrow n = 0, 1, 2, 3 \Rightarrow fa = n-1 \Rightarrow a = n-1$$

$$D = \left\{ \frac{n}{f} - \frac{1}{f} \mid n \in \mathbb{N} \right\}$$

$$b) y = \left(\frac{pa-p}{pa-\omega} \right)! \quad \textcircled{1} \quad pa-\omega \neq 0 \Rightarrow a \neq \frac{\omega}{p}$$

$$\textcircled{2} \quad \frac{pa-p}{pa-\omega} \in \mathbb{N} \quad \Leftrightarrow \quad \begin{aligned} pa-p &= n(pa-\omega) \\ pa-p &= pna-\omega n \end{aligned}$$

$$\Rightarrow pa - pna = p - \omega n \Rightarrow a(p-pn) = p - \omega n$$

$$\Rightarrow a = \frac{p - \omega n}{p - pn} \Rightarrow D = \left\{ \frac{p - \omega n}{p - pn} \mid n \in \mathbb{N} \right\}$$

نتیجه آخری : هم دستیار