

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

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

Sign charts and domain solutions are shown for both parts.

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

$x > 0 \Rightarrow x+|x| = 2x > 0 \Rightarrow D = (0, +\infty)$

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

$x < 0 \Rightarrow -x^2 < 0 \Rightarrow D = (0, +\infty)$

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

$\Rightarrow D = (-\infty, 3)$

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

سوال ۴) $[x - \frac{1}{x}] + [x - \frac{1}{x}] + 1 \geq 0 \Rightarrow 2[x - \frac{1}{x}] \geq -1 \Rightarrow [x - \frac{1}{x}] \geq -\frac{1}{2} \Rightarrow x - \frac{1}{x} \geq 0 \Rightarrow x \geq \frac{1}{x}$

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

$D = [\frac{1}{x}, +\infty)$ (منفی است)

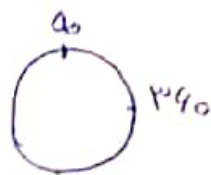
ب) $y = \sqrt{[x - \frac{1}{x}] + [-x + \frac{1}{x}]} \Rightarrow \beta = x - \frac{1}{x} \Rightarrow [B] + [-B] \Rightarrow \begin{matrix} t \in \mathbb{Z} \\ t \notin \mathbb{Z} \end{matrix}$

$= \{ \frac{1}{x} + n | n \in \mathbb{Z} \} \Rightarrow x - \frac{1}{x} \in \mathbb{Z} \Rightarrow$ می تواند باشد

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

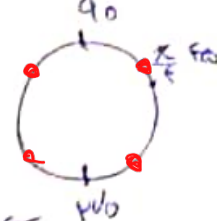
سوال ٥

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



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

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



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

سوال ٩

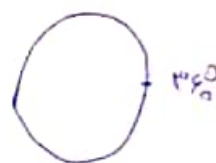
$$D = \left[\frac{\pi}{r} + 2k\pi, \frac{\omega\pi}{r} + 2k\pi \right]$$



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

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



سوال ٧

$$الف) \cos y = |x| - 3 \Rightarrow -1 \leq |x| - 3 \leq 1 \Rightarrow 2 \leq |x| \leq 4 \Rightarrow D = [-4, -2] \cup [2, 4]$$

$$ب) y = \arcsin(x^2 + 3x + 1) \Rightarrow -1 \leq x^2 + 3x + 1 \leq 1 \Rightarrow -1 \leq x^2 + 3x \leq 0$$

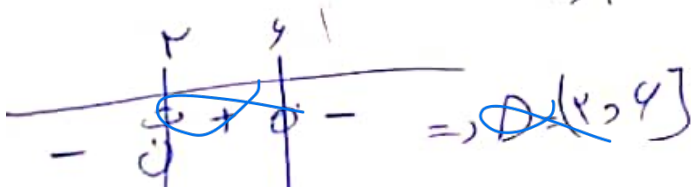
$$\Rightarrow (x+1)^2 \geq 0 \Rightarrow -1 \leq x+1 \leq 1 \Rightarrow -2 \leq x \leq 0 \Rightarrow D = [-2, 0]$$

$D_y = [-3, -2] \cup [-1, 0]$

صورت سوال اشتباه دید

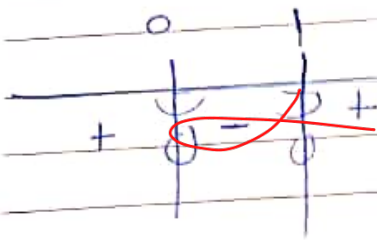
سوال ٨

$$الف) y = \sqrt{2 - \log_3(x-2)} \Rightarrow x-2 > 0 \Rightarrow x > 2 \Rightarrow 2 - \log_3(x-2) \geq 0 \Rightarrow \log_3(x-2) \leq 2 \Rightarrow x-2 \leq 9 \Rightarrow x \leq 11 \Rightarrow D = (2, 11]$$



① سوال

$$\begin{array}{r} -1 \quad 0 \quad 1 \\ - \quad + \quad - \quad + \end{array}$$



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

④ الزمر

(b) $y = \frac{x}{f^a + 1} \Rightarrow f + 1 \neq 0$
 $\Rightarrow f^a \neq -1 \Rightarrow \text{نوع} \Rightarrow \boxed{D=R}$

c) $y = \frac{f^0}{f^a - 1} \Rightarrow f^a - 1 \neq 0$
 $\Rightarrow f^a \neq 1 \Rightarrow f \neq 1 \Rightarrow D = \mathbb{R} - \{0\}$

$$e) y = \frac{r}{f^n - r} \Rightarrow f^n - r \neq 0 \Rightarrow n \neq \log f^r \Rightarrow f^{\frac{1}{n}-r} \Rightarrow n \neq \frac{1}{f}$$

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

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$$c) y = \frac{r}{f^a - r} \Rightarrow f^a \neq r$$

$$\Rightarrow D = R - \{ \log_2 4 \}$$

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

سوال 10

$$\Rightarrow fa+1 \in \mathbb{N}^+ \Rightarrow n \in \mathbb{N}^+ \Rightarrow fa = n-1 \Rightarrow a = \frac{n-1}{f}$$

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

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

$$\textcircled{2} \quad \frac{pa-p}{pa-\omega} \in \mathbb{N}$$

$$pa-p = n(pa-\omega)$$

$$pa-p = pa\omega - \omega n$$

با بهر متغیری که باشد

ل. و د

$$\Rightarrow pa - p\omega n = p - \omega n \Rightarrow a(p - \omega) = \frac{p - \omega n}{p - \omega}$$

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

نکته: در صورتی که