

نام و نام خانوادگی شماره کلاس تاریخ
پاسخنامه تشریحی تکلیف شماره ۳

الف) $y = \frac{x+3}{x^2+x-1}$ $\frac{x^2+x-1}{x^2+x-1} \cdot \frac{x+3}{x+3} = \frac{x^2+x-1}{x^2+x-1} \cdot \frac{x+3}{x+3}$
 $y = \frac{x+3}{(x^2+x-1)(x+3)}$
 $x^2+x-1 = 0 \rightarrow (x-1)(x+2) = 0 \rightarrow x = 1, -2 \rightarrow x = \frac{1}{2}, -\frac{1}{2}$

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ب) $y = \sqrt{\frac{x+1}{x^2+x-1}}$ $\frac{x^2+x-1}{x^2+x-1} \cdot \frac{x+1}{x+1} = \frac{x^2+x-1}{x^2+x-1} \cdot \frac{x+1}{x+1}$
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$y = \frac{2}{x^2-x-1}$ $x^2-x-1 = 0 \rightarrow (x-2)(x+1) = 0 \rightarrow x = 2, -1$
 $x \geq 1 \rightarrow x^2-x-1 = 0 \rightarrow (x-2)(x+1) = 0 \rightarrow x = 2, -1$
 $x \leq 1 \rightarrow x^2-x-1 = 0 \rightarrow (x-2)(x+1) = 0 \rightarrow x = 2, -1$

$D = \mathbb{R} - \{2, -1\}$

الف) $y = \sqrt{-x} - 2 \rightarrow [-x] - 2 \geq 0 \rightarrow [-x] \geq 2 \rightarrow x \leq -2 \rightarrow D = (-\infty, -2]$

ب) $y = \frac{x^2+4}{[x]^2-2[x]-3}$ $D = (-\infty, -1) \cup [0, 3) \cup [4, +\infty)$
 $a+c=b$
 $[x] = 3 \rightarrow 3 \leq x < 4$ $[x] = -1 \rightarrow -1 \leq x < 0$

الف) $y = \sqrt{[x-\frac{1}{2}] + [x+\frac{1}{2}]} \Rightarrow [x-\frac{1}{2}] + [x+\frac{1}{2}] \geq 0 \rightarrow [x-\frac{1}{2}] + [x+\frac{1}{2}] \geq 0 \rightarrow 2[x+\frac{1}{2}] \geq 0$
 $D = [\frac{1}{2}, +\infty)$

ب) $y = \sqrt{[x-\frac{1}{2}] + [\frac{1}{2}-x]} = \sqrt{[x-\frac{1}{2}] + [-(x-\frac{1}{2})]} \rightarrow \begin{cases} a \in \mathbb{Z} \rightarrow [a] + [-a] = 0 \\ a \notin \mathbb{Z} \rightarrow [a] + [-a] = -1 \end{cases} \rightarrow x - \frac{1}{2} \in \mathbb{Z}$

$D = \{x \mid x = k + \frac{1}{2}, k \in \mathbb{Z}\}$

$D_f = \left[r_k \pi - \frac{\omega \pi}{r}, r_k \pi - \frac{\pi}{r} \right] \cup \left[r_k \pi + \frac{\pi}{r}, r_k \pi + \frac{\omega \pi}{r} \right]$

الف) $y = \frac{\cot x + 1}{\tan x + 1} \rightarrow \tan x + 1 = 0 \rightarrow \tan x = -1 \rightarrow x = \frac{r_k \pi}{r}, \frac{\omega \pi}{r} \rightarrow k\pi - \frac{\pi}{r}$
 $D = \mathbb{R} - \left\{ k\pi + \frac{\pi}{r}, k\pi, k\pi - \frac{\pi}{r} \right\} \quad \tan x = 0 \rightarrow x = k\pi + \frac{\pi}{r}$

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ب) $y = \sqrt{1 - r \sin^2 x} \rightarrow 1 - r \sin^2 x \geq 0 \rightarrow (1 - r \sin x)(1 + r \sin x) \geq 0$
 $\sin x = \frac{1}{r} \rightarrow x = r_k \pi + \frac{\pi}{r}, r_k \pi + \frac{\omega \pi}{r}$

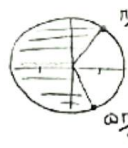
الف) $y = \sqrt{r \sin x - 1} \rightarrow r \sin x - 1 \geq 0$
 $\sin x \geq \frac{1}{r}$



$r_k \pi + \frac{\pi}{r} \leq x \leq r_k \pi + \frac{\omega \pi}{r}$
 $D = \left[r_k \pi + \frac{\pi}{r}, r_k \pi + \frac{\omega \pi}{r} \right]$

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ب) $y = \sqrt{1 - r \cos x} \rightarrow 1 - r \cos x \geq 0$
 $\cos x \leq \frac{1}{r}$



$r_k \pi + \frac{\pi}{r} \leq x \leq r_k \pi - \frac{\pi}{r}$
 $D = \left[r_k \pi + \frac{\pi}{r}, r_k \pi - \frac{\pi}{r} \right]$

الف) $y = \arcsin(r + r_1 + 1) \rightarrow -1 \leq r + r_1 + 1 \leq 1$

$D = [-r_1 - r] \cup [-1, 0]$

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ب) $\cos y = \sqrt{\omega - r_1} \rightarrow -1 \leq \sqrt{\omega - r_1} \leq 1$
 $D = \left[\frac{\pi}{r}, \frac{\omega}{r} \right]$

الف) $y = \log_r (1 - \log_{\frac{r}{r}}) \rightarrow 1 - \log_{\frac{r}{r}} > 0 \rightarrow 1 > \log_{\frac{r}{r}} \rightarrow \boxed{r > r_1}$

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ب) $y = \log_r (1 - \log_{\frac{r}{r}}) \rightarrow 1 - \log_{\frac{r}{r}} > 0 \rightarrow 1 > \log_{\frac{r}{r}} \rightarrow \boxed{r_1 < \frac{1}{r}}$

الف) $y = \sqrt{r^{x-r} - 1} \rightarrow r^{x-r} - 1 \geq 0 \rightarrow r^{x-r} \geq 1 \rightarrow r^{x-r} \geq r^0 \rightarrow x - r \geq 0 \rightarrow x \geq r$
 $D_f = [r, \infty)$

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ب) $y = \left(\frac{r^{x+\omega}}{r^{x+\varepsilon}} \right)! \rightarrow \frac{r^{x+\omega}}{r^{x+\varepsilon}} \in \mathbb{N} \rightarrow r^{x+\omega} = r^{x+\varepsilon} \cdot k \rightarrow r^{x+\omega} - r^{x+\varepsilon} = \varepsilon \cdot k$
 $D_f = \left\{ x / x = \frac{k \cdot k - \omega}{r - r_k}, k \in \mathbb{N} \right\}$