

پاسخنامه تشریحی تکلیف شماره ۳۳ کلاس ۲۰۲۳م رجبیه B.....

الف) $y = \frac{x^3}{x^3 + x^2 - 1}$ $D_f = \mathbb{R} - \left\{ \frac{1}{x}, -3 \right\}$

$$y = \frac{x^3 + 9x^2 + 14x + 3}{x^3 + 9x^2 + 14x + 3}$$

$$y = 1$$

ب) $D_f = (-\infty, -3] \cup (1, +\infty)$

$y = \sqrt{\frac{x+3}{x^2-2x^2+2x-1}}$

قسمت اولی دویم

قسمت اولی $x = -3$

قسمت دوم $x = 1$

$\frac{x+3}{(x^2-x+1)(x-1)} \geq 0$

نقطه بحرانی $x = -3$ و $x = 1$

نقطه بحرانی $x = -3$ و $x = 1$

3

۲۷

ΔV

مفتی می شود
و به درد ما
نمی خوره

الف) $y = \frac{\cot x + 1}{\tan x + 1} \rightarrow \frac{\cos x}{\sin x} + 1 \rightarrow \sin x \neq 0$
 $\rightarrow \frac{-\sin x}{\cos x} + 1 \neq 0 \rightarrow \tan x \neq -1 \rightarrow \cos x \neq 0$
 $\rightarrow \{k\pi\} = 0$
 $\rightarrow \{k\pi - \frac{\pi}{4}\} = 0$
 $\rightarrow \{k\pi + \frac{\pi}{4}\} = 0$
 $\rightarrow D_f = \mathbb{R} \setminus \{k\pi, k\pi - \frac{\pi}{4}, k\pi + \frac{\pi}{4}\}$

ب) $y = \sqrt{1 - \varepsilon \sin^2 x} \rightarrow 1 - \varepsilon \sin^2 x \geq 0 \rightarrow \varepsilon \sin^2 x \leq 1 \rightarrow \sin^2 x \leq \frac{1}{\varepsilon} \rightarrow \frac{1}{\sqrt{\varepsilon}} \leq \sin x \leq \frac{1}{\sqrt{\varepsilon}}$
 $D_f = [k\pi - \frac{\pi}{4}, k\pi + \frac{\pi}{4}]$

الف) $y = \sqrt{r \sin x - 1} \rightarrow r \sin x - 1 \geq 0 \rightarrow \sin x \geq \frac{1}{r} \rightarrow D_f = [r\pi + \frac{\pi}{2}, r\pi + \frac{3\pi}{2}]$

ب) $y = \sqrt{1 - r \cos x} \rightarrow r \cos x \leq 1 \rightarrow \cos x \leq \frac{1}{r} \rightarrow D_f = [r\pi + \frac{\pi}{r}, r\pi + \frac{3\pi}{r}]$

الف) $y = \arcsin(x^2 + cx + 1)$
 $\rightarrow x^2 + cx \leq 1 \rightarrow x(x+c) \leq 1$
 $\rightarrow -1 \leq x^2 + cx + 1 \leq 1$
 $\rightarrow x^2 + cx + 1 \geq 0 \rightarrow (x+r)(x+1) \geq 0$
 $D_f = [-c, -r] \cup [1, 0]$

ب) $\cos y = \sqrt{\omega - 2x} \rightarrow 0 \leq \omega - 2x \leq 1$
 $\rightarrow \omega \geq 2x \geq \varepsilon \rightarrow \frac{\omega}{2} \geq x \geq \frac{\varepsilon}{2} \rightarrow D_f = [\frac{\varepsilon}{2}, \frac{\omega}{2}]$

الف) $\log_p(1 - \log_p x)$
 $\rightarrow 1 - \log_p x > 0 \rightarrow \log_p x < 1 \rightarrow x < p$
 $D_f = (0, p)$

ب) $\log_p(1 - \log_{\frac{1}{p}} x)$
 $\rightarrow 1 - \log_{\frac{1}{p}} x > 0 \rightarrow \log_{\frac{1}{p}} x < 1 \rightarrow x > \frac{1}{p}$
 $D_f = (\frac{1}{p}, +\infty)$

الف) $y = \sqrt{\frac{\varepsilon x - x^2}{r}} - 1$
 $\rightarrow \frac{\varepsilon x - x^2}{r} - 1 \geq 0 \rightarrow \varepsilon x - x^2 \geq r$
 $\rightarrow x^2 - \varepsilon x + r \leq 0 \rightarrow (x-r)(x-1) \leq 0$
 $D_f = [1, r]$

ب) $y = \left(\frac{rx + \omega}{rx + \varepsilon}\right)!$
 $\rightarrow \frac{rx + \omega}{rx + \varepsilon} \in \mathbb{N} \rightarrow x \in \frac{-\varepsilon\mathbb{N} + \omega}{r\mathbb{N} - r}$
 $D_f = \{x | x = \frac{-\varepsilon\mathbb{N} + \omega}{r\mathbb{N} - r}, \mathbb{N} \in \mathbb{N}\}$

