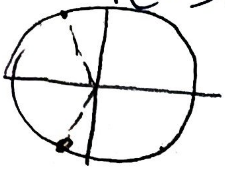
هلیا توکلیان

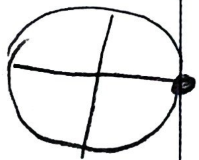
الف) $f: \dfrac{\sin x - 2}{2\cos x + 1} \Rightarrow 2\cos x + 1 \neq 0 \to \cos x \neq -\dfrac{1}{2}$



$D_f = \mathbb{R} - \left\{2k\pi + 2\dfrac{\pi}{3} ، 2k\pi + \dfrac{4\pi}{3}\right\}$ ۱

ب) $y = \dfrac{2\sin x + 1}{\cos x - 1} \Rightarrow \cos x - 1 \neq 0 \to \cos x \neq 1$

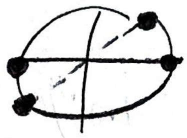
$D_f = \mathbb{R} - \{2k\pi\}$



الف) $y = \dfrac{2\sin x + 1}{\tan x + 1} \Rightarrow \begin{cases} \tan \to \dfrac{\sin}{\cos} \to \cos \neq 0 \\ \tan x + 1 \neq 0 \to \tan \neq -1 \end{cases}$

$D_f = \mathbb{R} - \left\{k\pi + \dfrac{3\pi}{4} ، k\pi + \dfrac{\pi}{2}\right\}$

ب) $y = \dfrac{\cos x + 1}{\cot x - 1} \begin{cases} \cot \to \dfrac{\cos}{\sin} \to \sin \neq 0 \\ \cot x - 1 \neq 0 \to \cot \neq 1 \end{cases}$ ۲



$D_f = \mathbb{R} - \left\{k\pi ، k\pi + \dfrac{\pi}{4}\right\}$

الف) $\sin y = x^2 - 2 \Rightarrow \underset{+2}{-1} \le \underset{+2}{x^2 - 2} \le \underset{+2}{1} \to 1 \le x^2 \le 3$

$\sqrt{1} \le x \le \sqrt{3} \longrightarrow D_f = [1 ، \sqrt{3}] \cup [-\sqrt{3} ، -1]$

$-1 \ge x \ge -\sqrt{3}$

ب) $\arccos(\sqrt{x} - 3) \begin{cases} x \ge 0 \quad \mathrm{I} \\ \underset{+3}{-1} \le \underset{+3}{\sqrt{x} - 3} \le \underset{+3}{1} \end{cases} \to 2 \le \sqrt{x} \le 4 \to \mathrm{II}$ ۳

$4 \le x \le 16 \xrightarrow{\mathrm{I} \cap \mathrm{II}} D_f = [4 ، 16]$

الف) $\cos y = |x|-3 \longrightarrow \underset{+3}{-1} \le |x| \underset{+3}{-3} \le \underset{+3}{1} \longrightarrow 2\le |x| \le 4$

$\longrightarrow 2 \le x \le 4$

$\longrightarrow -2 \ge x \ge -4$ $\longrightarrow D_f = [2,4] \cup [-4,-2]$

ب) $y = \arcsin(x^2+3x+1) \Rightarrow -1 \le x^2+3x+1 \le 1$ 4

$x^2+3x\underset{-1}{+1} \le \underset{-1}{1} \longrightarrow x^2+3x \le 0 \xrightarrow{\text{تجزیه}} x(x+3) \le 0$ I

$-1 \le x^2+3x+1 \longrightarrow 0 \le x^2+3x+2 \longrightarrow 0 \le (x+1)(x+2)$ II

$-3 \quad 0$: $+\ \ -\ \ +$ I $\qquad -2 \quad -1$: $+\ \ -\ \ +$ II $\xrightarrow{I \cap II} D_f = [-3,-2] \cup [-1,0]$

الف) $y = \log_3 (x^2-4)$
$\begin{cases} x^2-4>0 \\ 3>0 \checkmark \\ 3\neq 1 \checkmark \end{cases} \Longrightarrow x^2>4 \longrightarrow \begin{matrix} x>2 \\ x<-2 \end{matrix}$

$D_f = (-\infty,-2) \cup (2,+\infty)$

ب) $y = \log_2 (2-|x|)$
$\begin{cases} 2-|x|>0 \longrightarrow |x|<2 \longrightarrow -2<x<2 \\ 2>0 \\ 2\neq 1 \end{cases}$ 5

$D_f = (-2,2)$

$y = \log_{x-3}(5-x)$
$\begin{cases} 5-x>0 \longrightarrow x<5 \\ x-3>0 \longrightarrow x>3 \\ x-3\neq 1 \longrightarrow x\neq 4 \end{cases}$ $D_f = (3,5)-\{4\}$

$y = \log_{x+3}(x^2-1)$
$\begin{cases} x^2-1>0 \longrightarrow x^2>1 \longrightarrow \boxed{\begin{matrix} x>1 \\ x<-1 \end{matrix}} \\ x+3>0 \longrightarrow x>-3 \\ x+3\neq 0 \longrightarrow x\neq -2 \end{cases}$ 6

$D_f = (-3,-1) \cup (1,+\infty) - \{-2\}$

الف) $y = \log \frac{x^2-4x+3}{x-3} \longrightarrow \frac{x^2-4x+3}{x-3} > 0 \quad \frac{(x-1)(x-3)}{x-3} > 0$ 7

$1 \quad 3^*$: $-\ \ +\ \ +$ $\qquad D_f = (1,+\infty) - \{3\}$

ب) $y=\log_{x+5}\frac{x+3}{x-2}$ ۷

$\frac{x+3}{x-2}>0 \to$ $\begin{array}{ccccc} & -3 & & 2 & \\ + & \vert & - & \vert & + \end{array}$

$x+5>0 \to x>-5$

$x+5\neq 1 \to x\neq -4$

$D_f=(-5,-3)\cup(2,+\infty)-\{-4\}$

الف) $y=\sqrt{3-\log_2^{x-2}} \Rightarrow 3-\log_2^{x-2}\geq 0 \to \log_2^{x-2}\leq 3$

$\begin{cases} x-2>0 \to x>2 \\ 2>0 ✓ \\ 2\neq 1 ✓ \end{cases}$

$x-2\leq 8 \to \boxed{x\leq 10}$

$D_f=(2,10]$

ب) $y=\log(2\log_3^x-1)$ ۸

$\begin{cases} 2\log_3^x-1>0 \to \log_3^x>\frac{1}{2} \\ x>0 \end{cases}$

$x>3^{\frac{1}{2}}$

$\Downarrow$

$x>\sqrt{3}$

$D_f=(\sqrt{3},+\infty)$

الف) $y=\frac{3}{4^x+1} \to 4^x+1\neq 0 \to 4^x\neq -1 \to D_f=\mathbb{R}$

همیشه برقرار است

ب) $y=\frac{3}{4^x-1} \to 4^x-1\neq 0 \to 4^x\neq 1 \to x\neq 0 \to$

$D_f=\mathbb{R}-\{0\}$

ج) $y=\frac{3}{4^x-2} \to 4^x-2\neq 0 \to 4^x\neq 2 \to x\neq \log_4^2$ ۹

$D_f=\mathbb{R}-\{\log_4^2\}$

د) $y=\frac{3}{4^x-3} \to 4^x-3\neq 0 \to 4^x\neq 3 \to x\neq \log_4^3$

$D_f=\mathbb{R}-\{\log_4^3\}$

الف) $y=(4x+1)! \Rightarrow 4x+1\in W \to x=\frac{W-1}{4}$

$D_f=\{x \mid x=\frac{k-1}{4},\ k\in W\}$ ۱۰

ب) $y=\frac{3x-2}{2x-5}! \Rightarrow \frac{3x-2}{2x-5}\in W \to 3x-2=2xW-5W \to$

$3x-2xW=2-5W$

$D_f=\{x \mid x=\frac{2-5k}{3-2k},\ k\in W\} \leftarrow x=\frac{2-5W}{3-2W}$