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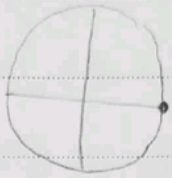
١)

الف) $y=\frac{\sin x-2}{2\cos x+1}$ $\quad 2\cos x+1\neq 0$

$\cos x\neq -\frac{1}{2}$

$D_f=\mathbb{R}-\{2k\pi\pm\frac{2\pi}{3}\}$

ب) $y=\frac{\sin x+2}{\cos x-1}$ $\quad \cos x-1\neq 0$



$\cos x\neq 1$

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

٢)

الف) $y=\frac{2\sin x+1}{\tan x+1}$ $\quad \tan x+1\neq 0$

$\tan x\neq -1$

$\cos\neq 0$

$D_f=\mathbb{R}-\{k\pi-\frac{\pi}{4}\}$, $k\in\mathbb{Z}$ $+\frac{\pi}{2}$

ب) $y=\frac{\cos x+1}{\cot x-1}$ $\quad \cot x-1\neq 0$

$\cot x\neq 1$

$\sin\neq 0$

$D_f=\mathbb{R}-\{k\pi+\frac{\pi}{4}\}$, $k\in\mathbb{Z}$

٣)

الف) $\sin y=x^2-2$ $\quad -1\leq x^2-2\leq 1$

$1\leq x^2\leq 3$

$1\leq x\leq\sqrt{3}$

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

$D_f=[-\sqrt{3},-1]\cup[1,\sqrt{3}]$

ب) $y=\arccos(\sqrt{x}-2)$

$D_f=[0,16]$

$x\geq 0$ $\quad -1\leq\sqrt{x}-2\leq 1$

1

$1\leq\sqrt{x}\leq 3$

$1\leq x\leq 9$

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۴) الف) $\cos y = |x| - 3$ $-1 \le |x| - 3 \le 1$

$D_f = [-4,-2] \cup [2,4]$ $2 \le |x| \le 4$

$2 \le x \le 4$ ۲ ✓

$-2 \ge x \ge -4$

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

$(-\infty, -2] \cup [-1, +\infty) \leftarrow 0 \le x^2 + 3x + 2$ $0 \le (x+1)(x+2)$

$-2 \quad -1$

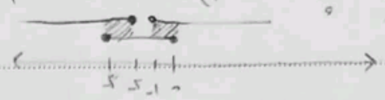
$+ \quad | \quad - \quad | \quad +$

$\cap$ $[-3, 0] \leftarrow x^2 + 3x \le 0$ $x(x+3) \le 0$

$-3 \quad 0$

$+ \quad | \quad - \quad | \quad +$

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



۵) الف) $y = \log_3^{x^2-4}$ $x^2 - 4 > 0$

$D_f = (-\infty, -2) \cup (2, +\infty)$ $x^2 > 4 \rightarrow 2 < x \quad , \quad x < -2$

$3 > 0 \quad 3 \ne 1$

ب) $y = \log_3^{2-|x|}$ $2 - |x| > 0$ ۲ ✓

$D_f = (-2, 2)$ $|x| < 2 \rightarrow -2 < x < 2$

$3 > 0 \quad 3 \ne 1$

۶) الف) $y = \log_{x-3}^{5-x}$ $5 - x > 0$ $x - 3 > 0$

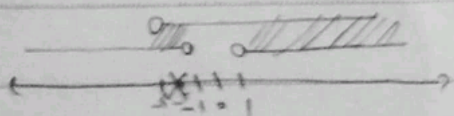
$x < 5$ $\cap$ $x > 3$ $x - 3 \ne 1 \rightarrow x \ne 4$

$D_f = (3, 5) - \{4\}$ $3 < x < 5$ ۲ ✓

ب) $y = \log_{x+3}^{x^2-1}$ $x^2 - 1 > 0$ $x + 3 > 0$

$x^2 > 1 \rightarrow x > 1$ $x > -3$ $x + 3 \ne 1$ $x \ne -2$

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



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۷) الف) $y = \log \frac{x^3 - 4x + 2}{x - 2}$

$D_f = (1, 2) \cup (2, +\infty)$

$\frac{x^3 - 4x + 2}{x - 2} > 0$

ب) $y = \log \frac{x + 2}{x - 1}$

$D_f = (-\infty, -2) - \{-4\} \cup (1, +\infty)$

$\frac{x + 2}{x - 1} > 0$

$x + 2 \neq 1 \quad x \neq -1$

۸) الف) $y = \sqrt{2 - \log_2(x - 2)}$

$D_f = (2, 10]$

ب) $y = \log(2 \log_4^x - 1)$

$x > 0$

$2 \log_4^x - 1 > 0$

$\log_4^x > \frac{1}{2}$

$x > \sqrt{4}$

$D_f = (\sqrt{4}, +\infty)$

۹) الف) $y = \frac{2}{4^x + 1} \neq 0$

$4^x \neq -1$ همواره برقرار

$D_f = \mathbb{R}$

ب) $y = \frac{2}{4^x - 1} \neq 0$

$4^x \neq 1$

$x \neq 0$

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

ج) $y = \frac{2}{4^x - 2} \neq 0$

$4^x \neq 2$

$x \neq \log_4^2$

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

د) $y = \frac{2}{4^x - 2} \neq 0$

$4^x \neq 2$

$x \neq \log_4^2$

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

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۱۰) الف) $y = (4x+1)!$ $4x+1 \in W$ $4x \in W-1$

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

ب) $y = \left(\frac{3x-2}{2x-5}\right)!$ $\frac{3x-2}{2x-5} \in W$ $3x-2 \in 2xW - 5W$

$3x - 2xW \in -5W + 2$

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

۲ ✓