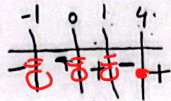


۱۷، ۷۵

الف) $y = \sqrt{\frac{x^2 - 4x}{x^3 - x}} \Rightarrow \frac{x^2 - 4x}{x^3 - x} \geq 0$

$\frac{x(x-4)}{x(x-1)(x+1)} \geq 0$



$D_f = (-1, 0) \cup (0, 1) \cup [4, +\infty)$

۱، ۵ ✓

ب) $y = \sqrt{\frac{x^4 - x^3}{x^3 - x}} \Rightarrow \frac{x^4 - x^3}{x^3 - x} \geq 0$

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

Number line diagram for the inequality x^3(x-1)/(x(x-1)(x+1)) >= 0. The number line has points at -1, 0, 1. The intervals are: (-1, 0) is negative, (0, 1) is positive, and (1, infinity) is negative. The solution set is the interval (0, 1).

$D_f = \mathbb{R} - [1, 0, -1]$

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

$x \neq 0$
 $x \neq \text{منفی}$

$D_f = (0, +\infty)$

۲ ✓

$\begin{cases} x > 0 \\ |x| = x \\ x < 0 \\ |x| = -x \end{cases}$

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

$x > 0$
 $x < 0$

$D_f = (0, +\infty)$

۲

الف) $y = \sqrt{2 - [x]} \Rightarrow 2 - [x] \geq 0$
 $2 \geq [x]$

$D_f = (-\infty, 2)$

۳ ✓

ب) $y = \frac{1}{\sqrt{2 - [x]}} \Rightarrow 2 - [x] > 0$

$[x] < 2$

$D_f = (-\infty, 2)$

۳

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

$x + \frac{1}{x} = x - \frac{1}{x} + 1 \Rightarrow [x - \frac{1}{x}] + 1 + [x - \frac{1}{x}] + ([x - \frac{1}{x}] + 1)$

$2[x - \frac{1}{x}] \geq -1$

$x \geq \frac{1}{x}$

$D_f = [\frac{1}{x}, +\infty)$

۴ ①

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

$x - \frac{1}{x} \in \mathbb{Z} \rightarrow x \in \mathbb{Z} + \frac{1}{x}$

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

۴

الف) $y = \frac{1}{\sin x - 1} \Rightarrow \sin x - 1 \neq 0$
 $\sin x \neq 1$

$D_f = \{x \mid x \neq 2k\pi + \frac{\pi}{2}\}$

۵ ② ✓

ب) $y = \frac{1}{x \sin^2 x - 1}$

$x \sin^2 x - 1 \neq 0 \Rightarrow \sin x \neq \sqrt{\frac{1}{x}}$

$D_f = \mathbb{R} - [k\pi + \frac{\pi}{2}, k\pi + \frac{\pi}{2}]$

۵

الف) $y = \sqrt{2 \sin x - 1} \Rightarrow 2 \sin x - 1 \geq 0$ $\sin x \geq \frac{1}{2}$ $D_f = \left[2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6} \right]$ 1, 7, 8 بايد باينوبي	ب) $y = \sqrt{\cos x - 1} \Rightarrow \cos x - 1 \geq 0$ $\cos x \geq 1$ $D_f = \{2k\pi\}$ 6		
الف) $\cos y = x \Rightarrow -1 \leq x \leq 1$ $-1 \leq x \leq 1$ $D_f = [-1, 1]$ 1, 7, 8	ب) $y = \arcsin(x^2 + 2x + 1)$ $-1 \leq x^2 + 2x + 1 \leq 1$ $D_f = [-2, -1] \cup [0, 1]$ 7		
الف) $y = \sqrt{2 - \log_2(x-2)}$ $2 - \log_2(x-2) \geq 0$ $\log_2(x-2) \leq 2$ $x-2 \leq 4 \Rightarrow x \leq 6$ $x-2 > 0 \Rightarrow x > 2$ $D_f = (2, 6]$ 1, 7, 8	ب) $y = \log(x^2 - x) \Rightarrow x^2 - x > 0$ $x(x-1)(x+1) > 0$ $D_f = (-1, 0) \cup (1, +\infty)$ 8		
$y = \frac{1}{x^2 + 1}$ $x^2 + 1 \neq 0$ $x^2 \neq -1$ $D_f = \mathbb{R}$	$y = \frac{1}{x^2 - 1}$ $x^2 - 1 \neq 0$ $x^2 \neq 1$ $D_f = \mathbb{R} - \{-1, 1\}$	$y = \frac{1}{x^2 - 2}$ $x^2 - 2 \neq 0$ $x^2 \neq 2$ $x \neq \pm \sqrt{2}$ $D_f = \mathbb{R} - \{\pm \sqrt{2}\}$ 9	$y = \frac{1}{x^2 - 3}$ $x^2 - 3 \neq 0$ $x^2 \neq 3$ $x \neq \pm \sqrt{3}$ $D_f = \mathbb{R} - \{\pm \sqrt{3}\}$ 9
الف) $y = (x+1)!$ $x+1 \in \mathbb{N}$ $x = \frac{n-1}{1}$ $D_f = \left\{ x \mid x = \frac{k-1}{1}, k \in \mathbb{N} \right\}$ 9	ب) $\left(\frac{x^2 - 2}{x^2 - 5} \right)! \Rightarrow \frac{x^2 - 2}{x^2 - 5} \in \mathbb{N}$ $x^2 - 2 \in \mathbb{N}$ $x^2 - 5 \in \mathbb{N}$ $D_f = \left\{ x \mid x = \frac{k-5}{1}, k \in \mathbb{N} \cup \{0\} \right\}$ 10		