

نام و نام خانوادگی: شماره: کلاس:
 نام:
 A

الف) $y = \sqrt{\frac{x^2-4x}{x^3-x}} = \frac{x^2-4x}{x^3-x} \geq 0 \rightarrow \frac{x(x-4)}{x(x^2-1)} \geq 0 \rightarrow \frac{-1}{x+1} \geq 0$
 $D: (-1,0) \cup (0,1) \cup (1,+\infty)$

ب) $y = \sqrt{\frac{x^5-x^3}{x^3-x}} = \frac{x^5-x^3}{x^3-x} \geq 0 \rightarrow \frac{x^3(x^2-1)}{x(x^2-1)} \geq 0 \rightarrow \frac{-1}{x} \geq 0$
 $D: (-\infty,-1) \cup (-1,0) \cup (0,1) \cup (1,+\infty)$

الف) $y = \frac{x+1}{\sqrt{x+1x}} \rightarrow x+1 \geq 0 \rightarrow x \geq -1$
 $0x \rightarrow 0+0=0 \rightarrow D: \mathbb{R}^+$
 $-x \rightarrow -x+1=0 \rightarrow x=1$
 $+ \sqrt{-} \rightarrow (+) \cdot (+) = +$

ب) $y = \frac{1}{\sqrt{x+1x}} \rightarrow x+1 \geq 0 \rightarrow x \geq -1$
 $0x \rightarrow 0 \cdot 0 = 0$
 $-x \rightarrow -x+1=0 \rightarrow x=1$
 $+ \sqrt{-} \rightarrow +x+1=+$

الف) $y = \sqrt{2-[x]} \rightarrow 2-[x] \geq 0 \rightarrow [x] \leq 2 \rightarrow D: (-\infty, 3)$

ب) $y = \frac{1}{\sqrt{2-[x]}} \rightarrow 2-[x] > 0 \rightarrow 2 > [x] \rightarrow D: (-\infty, 2)$

الف) $y = \sqrt{[x-\frac{1}{3}]} + [x+\frac{2}{3}] \rightarrow [x+\frac{2}{3}-1] + [x+\frac{2}{3}] \rightarrow 2[x+\frac{2}{3}]-1 \geq 0$
 $2[x+\frac{2}{3}] \geq 1 \rightarrow [x+\frac{2}{3}] \geq \frac{1}{2} \rightarrow x+\frac{2}{3} \geq \frac{1}{2} \rightarrow x \geq -\frac{1}{6} \rightarrow D: [-\frac{1}{6}, +\infty)$

ب) $y = \sqrt{[x-\frac{1}{3}]} + [-x+\frac{1}{3}] \rightarrow [x-\frac{1}{3}] + [-(x-\frac{1}{3})] \rightarrow [x-\frac{1}{3}] + [-x+\frac{1}{3}] = 0$
 $D: \{x | x \in \mathbb{Z} + \frac{1}{3}, k \in \mathbb{Z}\}$

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

 $D: \mathbb{R} - \{2k\pi + \frac{\pi}{2}\}$

ب) $y = \frac{3}{2 \sin^2 x - 1} \rightarrow 2 \sin^2 x - 1 \neq 0 \rightarrow \sin^2 x \neq \frac{1}{2}$
 $\rightarrow D: \mathbb{R} - \{\sin x = \pm \frac{1}{\sqrt{2}}\}$

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الف) $y = \sqrt{4 \sin x - 1} \rightarrow 4 \sin x - 1 \geq 0 \rightarrow 4 \sin x \geq 1 \rightarrow \sin x \geq \frac{1}{4}$

$\rightarrow D_f = \left[\arcsin \frac{1}{4}, \pi - \arcsin \frac{1}{4} \right]$

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

$\rightarrow D_f = \{2k\pi\}$

الف) $\cos y = |x| - 3 \rightarrow -1 \leq |x| - 3 \leq 1 \rightarrow 2 \leq |x| \leq 4$

$\rightarrow D_f = [2, 4] \cup [-4, -2]$

ب) $y = \arcsin(x^2 + 3x + 1)$

$\rightarrow -1 \leq x^2 + 3x + 1 \leq 1$
 $x^2 + 3x + 1 \leq 1 \rightarrow x^2 + 3x \leq 0 \rightarrow x(x+3) \leq 0$
 $x^2 + 3x + 1 \geq -1 \rightarrow x^2 + 3x + 2 \geq 0 \rightarrow (x+1)(x+2) \geq 0$

$\rightarrow D_f = [-1, -2] \cup [0, +\infty)$

الف) $y = \sqrt{4 - \ln(x-1)}$

$\rightarrow x - 1 > 0 \rightarrow x > 1$

$\rightarrow 4 - \ln(x-1) \geq 0 \rightarrow 4 \geq \ln(x-1) \rightarrow x-1 \leq e^4 \rightarrow x \leq 1 + e^4$

ب) $y = \ln(x^3 - x)$

$\rightarrow x^3 - x > 0 \rightarrow x(x^2 - 1) > 0$
 $\rightarrow x(x-1)(x+1) > 0$
 $\rightarrow D_f = (-1, 0) \cup (1, +\infty)$

الف) $y = \frac{x}{x^2 + 1}$

$\rightarrow x^2 + 1 \neq 0 \rightarrow x \neq -1 \rightarrow D_f = \mathbb{R} \setminus \{-1\}$

ب) $y = \frac{x}{x^2 - 1}$

$\rightarrow x^2 - 1 \neq 0 \rightarrow x \neq \pm 1 \rightarrow x = 0 \rightarrow D_f = \mathbb{R} \setminus \{0\}$

ج) $y = \frac{x}{x^2 - 4}$

$\rightarrow x^2 - 4 \neq 0 \rightarrow x \neq \pm 2 \rightarrow x = \frac{1}{2} \rightarrow D_f = \mathbb{R} \setminus \{\frac{1}{2}\}$

د) $y = \frac{x}{x^2 - 9}$

$\rightarrow x^2 - 9 \neq 0 \rightarrow x \neq \pm 3 \rightarrow x = \frac{1}{3} \rightarrow D_f = \mathbb{R} \setminus \{\frac{1}{3}\}$

الف) $y = (x^2 + 1)^{\frac{1}{x}}$

$\rightarrow x^2 + 1 \in \mathbb{W} \rightarrow x \in \mathbb{W} \setminus \{0\} \rightarrow D_f = \{x | x = \frac{k+1}{k}, k \in \mathbb{W}\}$

ب) $y = \left(\frac{x^2 - 2}{x^2 - 5} \right)^{\frac{1}{x}}$

$\rightarrow \frac{x^2 - 2}{x^2 - 5} \in \mathbb{W} \rightarrow x^2 - 2 \in x^2 \mathbb{W} - 5\mathbb{W}$
 $x^2 - 2 = x^2 k - 5l \rightarrow x^2 = \frac{2 - 5l}{k}$

$\rightarrow x \in \frac{2 - 5l}{k} \rightarrow D_f = \{x | x = \frac{2 - 5l}{k}, k \in \mathbb{W}\}$