

نام و نام خانوادگی: پست: پاسنامه تشریحی تکلیف شماره: کلاس: ^A ^{18, 8}

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

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

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

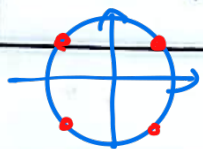
ب) $y = \frac{1}{\sqrt{2 - [x]}} \rightarrow 2 - [x] > 0 \rightarrow 2 > [x] \rightarrow D: (-\infty, 2)$

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

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) $y = \frac{3}{2 \sin^2 x - 1} \rightarrow 2 \sin^2 x - 1 \neq 0 \rightarrow \sin^2 x \neq \frac{1}{2}$
 $D: \mathbb{R} - \{\sin^{-1} \frac{1}{\sqrt{2}}, \sin^{-1} \frac{1}{\sqrt{2}} + \pi, \sin^{-1} \frac{1}{\sqrt{2}} + 2\pi, \dots\}$



$\rightarrow \sin^2 x \neq \frac{1}{2} \rightarrow \sin x \neq \pm \frac{1}{\sqrt{2}}$
 $D: \mathbb{R} - \{\sin^{-1} \frac{1}{\sqrt{2}}, \sin^{-1} \frac{1}{\sqrt{2}} + \pi, \sin^{-1} \frac{1}{\sqrt{2}} + 2\pi, \dots\}$

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

Ⓟ ✓

$\rightarrow D_f = [x_k \pi + \frac{\pi}{6}, x_k \pi + \frac{5\pi}{6}]$

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

$\rightarrow D_f = \{x_k \pi\}$

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

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

1, 6 ✓

ب) $y = \arcsin(x^2 + 3x + 1)$

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

الف) $y = \sqrt{4 - \frac{1}{x^3}} \rightarrow x - 2 > 0 \rightarrow x > 2$

Ⓟ ✓

$\rightarrow 4 - \frac{1}{x^3} \geq 0 \rightarrow 4 \geq \frac{1}{x^3} \rightarrow x^3 \geq \frac{1}{4} \rightarrow x \geq \sqrt[3]{\frac{1}{4}}$

ب) $y = \frac{1}{x^3 - x} \rightarrow x^3 - x > 0 \rightarrow x(x^2 - 1) > 0$

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

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

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

الف) $y = (x^2 + 1)^{\frac{1}{x}} \rightarrow x^2 + 1 \in \mathbb{W} \rightarrow x \in \mathbb{W} \setminus \{-1\} \rightarrow D_f = \{x | x = \frac{k+1}{k}, k \in \mathbb{W}\}$

Ⓟ ✓

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

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