

الف) $\sqrt{\frac{x^2 - 4}{x^3 - x}} = \frac{x(x-2)}{x(x+1)(x-1)}$ $\Rightarrow \frac{1}{x+1} + \frac{1}{x-1} - \frac{1}{x}$

ب) $(-1, 0) \cup (0, 1) \cup (2, +\infty)$ $\Rightarrow$ $\frac{x^2 - 4}{x^3 - x} = \frac{x^2(x^2 - 1)}{x^2(x^2 - 1)}$ $\Rightarrow \frac{1}{x+1} + \frac{1}{x-1} - \frac{1}{x}$ $P_f = \mathbb{R} - \{-1, 0, 1\}$

الف) $\frac{x+1}{\sqrt{x+1}} = \sqrt{x+1}$ $\Rightarrow x+1 \geq 0 \Rightarrow x \geq -1$ $P_f = (0, +\infty)$

ب) $\frac{1}{\sqrt{x+1}}$ $\Rightarrow x+1 > 0 \Rightarrow x > -1$ $P_f = (0, +\infty)$

الف) $y \in \sqrt{2-x}$ $\Rightarrow 2-x \geq 0 \Rightarrow x \leq 2$ $\Rightarrow x \in (-\infty, 2]$ $P_f = (-\infty, 2]$

ب) $y \in \frac{1}{\sqrt{2-x}}$ $\Rightarrow 2-x > 0 \Rightarrow x < 2$ $\Rightarrow x \in (-\infty, 2)$ $P_f = (-\infty, 2)$

الف) $y \in \sqrt{[x-\frac{1}{2}] + [x+\frac{1}{2}]}$ $\Rightarrow [x-\frac{1}{2}] \geq 0$ $\Rightarrow x \geq \frac{1}{2}$ $P_f = [\frac{1}{2}, +\infty)$

ب) $y \in \sqrt{[x-\frac{1}{2}] + [-x+\frac{1}{2}]}$ $\Rightarrow [x-\frac{1}{2}] \geq 0$ $\Rightarrow x \geq \frac{1}{2}$ $P_f = [\frac{1}{2}, +\infty)$

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الف) $y = \frac{x}{\sin x - 1}$ $\Rightarrow \sin x - 1 \neq 0 \Rightarrow \sin x \neq 1$ $\Rightarrow x \neq \frac{\pi}{2} + 2k\pi$ $P_f = \mathbb{R} - \{\frac{\pi}{2} + 2k\pi\}$

ب) $y = \frac{x}{\sin^2 x - 1}$ $\Rightarrow \sin^2 x - 1 \neq 0 \Rightarrow \sin^2 x \neq 1$ $\Rightarrow \sin x \neq \pm 1$ $\Rightarrow x \neq \frac{\pi}{2} + k\pi$ $P_f = \mathbb{R} - \{\frac{\pi}{2} + k\pi\}$

الف) $y = \frac{x}{\sin x - 1}$ $\Rightarrow \sin x - 1 \neq 0 \Rightarrow \sin x \neq 1$ $\Rightarrow x \neq \frac{\pi}{2} + 2k\pi$ $P_f = \mathbb{R} - \{\frac{\pi}{2} + 2k\pi\}$

الف) $y = \sqrt{x \sin x - 1} \Rightarrow x \sin x \geq 1, \frac{1}{x} D_f = \left[2k\pi + \frac{\pi}{2}, 2k\pi + \frac{3\pi}{2} \right]$
 باید بازه بی

ب) $y = \sqrt{\cos x - 1} \Rightarrow \cos x \leq 0, \frac{1}{x} D_f = \{2k\pi\}$

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

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

1.7.5

جدول تعیین علامت باید بیفتی

ب) $y = \arcsin(x^2 + 3x + 1) \Rightarrow -1 \leq x^2 + 3x + 1 \leq 1 \Rightarrow x^2 + 3x + 1 \leq 1 \Rightarrow x^2 + 3x \leq 0 \Rightarrow x(x+3) \leq 0 \Rightarrow -3 \leq x \leq 0$

$x(x+3) \leq 0 \Rightarrow -3 \leq x \leq 0 \Rightarrow x^2 + 3x + 1 \geq -1 \Rightarrow x^2 + 3x + 2 \geq 0 \Rightarrow (x+1)(x+2) \geq 0 \Rightarrow x \leq -2 \text{ or } x \geq -1$
 اشتراک $\Rightarrow D_f = [-3, -2] \cup [-1, 0]$

الف) $\sqrt{2 - \log_3(x-1)} \Rightarrow x-1 \geq 0 \Rightarrow x \geq 1 \Rightarrow 2 - \log_3(x-1) \geq 0 \Rightarrow \log_3(x-1) \leq 2 \Rightarrow x-1 \leq 9 \Rightarrow x \leq 10 \Rightarrow D_f = [1, 10]$

ب) $y = \log(x^2 - x) \Rightarrow x^2 - x > 0 \Rightarrow x(x-1) > 0 \Rightarrow x < 0 \text{ or } x > 1$

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

الف) $y = \frac{x}{e^x + 1} \Rightarrow e^x \neq -1 \Rightarrow x \neq -i$

$D_f = \mathbb{R}$

ب) $y = \frac{x}{e^x - 1} \Rightarrow e^x \neq 1 \Rightarrow x \neq 0$

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

ج) $y = \frac{x}{e^x - 2} \Rightarrow e^x \neq 2 \Rightarrow x \neq \ln 2$

$D_f = \mathbb{R} - \{\ln 2\}$

د) $y = \frac{x}{e^x - 3} \Rightarrow e^x \neq 3 \Rightarrow x \neq \log_3 e$

$D_f = \mathbb{R} - \{\log_3 e\}$

الف) $y = (\epsilon x + 1)!$ $\epsilon x + 1 = k, k \in \mathbb{N} \Rightarrow x = \frac{k-1}{\epsilon} \Rightarrow D_f = \left\{ x = \frac{k-1}{\epsilon} \mid k \in \mathbb{N} \right\}$

1.7.6

ب) $\left(\frac{x-1}{x-2} \right)!$ $\frac{x-1}{x-2} = k, k \in \mathbb{N} \Rightarrow x = \frac{\omega k + 2}{\omega k + 1}$

$D_f = \left\{ x \mid x = \frac{\omega k + 2}{\omega k + 1}, k \in \mathbb{N} \right\}$