

Subject:

Year: Month: Day: ()

المواضيع - الامتحان

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

$D_f = \mathbb{R} - \left\{ 2k\pi + \frac{\pi}{2}, 2k\pi + \frac{3\pi}{2} \right\}$



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

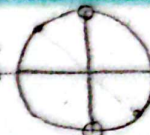
$D_f = \mathbb{R} - \{ 2k\pi \}$



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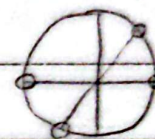
الف) $y = \frac{1 \sin x + 1}{\tan x + 1} = \tan x \neq -1 \Rightarrow D_f = \mathbb{R} - \left\{ k\pi + \frac{\pi}{4}, k\pi - \frac{\pi}{4} \right\}$

$\tan x \rightarrow \sin x / \cos x \rightarrow \cos x \neq 0$



ب) $y = \frac{\cos x + 1}{\cot x - 1} = \cot x \neq 1 \Rightarrow D_f = \mathbb{R} - \{ k\pi, k\pi + \pi \}$

$\cot x \rightarrow \cos x / \sin x \rightarrow \sin x \neq 0$



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الف) $\sin y = x^2 - 2 \Rightarrow -1 \leq x^2 - 2 \leq 1 \Rightarrow 1 \leq x^2 \leq 3 \Rightarrow \sqrt{1} \leq x \leq \sqrt{3} \quad D_f = [-\sqrt{3}, -1] \cup [1, \sqrt{3}]$
 $-\sqrt{3} \leq x \leq -1$

ب) $y = \arccos(\sqrt{x} - 3) \Rightarrow -1 \leq \sqrt{x} - 3 \leq 1 \Rightarrow 2 \leq \sqrt{x} \leq 4 \Rightarrow 4 \leq x \leq 16 \quad D_f = [4, 16]$

الف) $\cos y = |x| - 3 \Rightarrow -1 \leq |x| - 3 \leq 1 \Rightarrow 2 \leq |x| \leq 4 \Rightarrow 2 \leq x \leq 4 \quad D_f = [-4, -2] \cup [2, 4]$
 $-4 \leq x \leq -2$

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

① $x^2 + 3x + 1 \geq -1 \Rightarrow x^2 + 3x + 2 \geq 0 \Rightarrow (x+1)(x+2) \geq 0 \Rightarrow x \leq -2 \text{ or } x \geq -1$
 ② $x^2 + 3x + 1 \leq 1 \Rightarrow x^2 + 3x \leq 0 \Rightarrow x(x+3) \leq 0 \Rightarrow -3 \leq x \leq 0$

$(-\infty, -2] \cup [-1, +\infty) \cap (-3, 0] = (-3, -2] \cup [-1, 0]$

20

$\hookrightarrow [-3, -2] \cup [-1, 0]$

الف) $y = \log_{\frac{1}{2}} x \Rightarrow x > 0 \quad x^2 > 2 \Rightarrow x > \sqrt{2} \quad D = (-\infty, -\sqrt{2}) \cup (\sqrt{2}, \infty)$
 $x < -\sqrt{2}$

ب) $y = \log_{\frac{1}{2}} |x| \Rightarrow |x| > 0 \Rightarrow -2 < x < 2 \quad D = (-2, 2)$

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الف) $y = \log_{x-2}^{x-1}$ $x-1 > 0 \Rightarrow x > 1$ $x-2 \neq 1$ $D_f = (1, \infty) - \{3\}$ 4
 $x-2 > 0 \Rightarrow x > 2$ $x \neq 3$

ب) $y = \log_{x+3}^{x^2-1}$ $x^2-1 > 0$ $x^2 > 1$ $x > 1$ $x < -1$
 $x+3 > 0$ $x > -3$ $x \neq -2$ $D_f = (1, \infty) \cup (-3, -1) - \{-2\}$ 5
 $x+3 \neq 1$ $x \neq -2$ $x \neq -2$

الف) $y = \log_{x-2}^{x^2-5x+6}$ 6. جواب ایا نه صحاح ←

ب) $\log_{x+2} \frac{x+2}{x-2}$ $\frac{x+2}{x-2} > 0$ $\frac{-x+2}{x-2} > 0$ $x \neq 2$ $x \in (-\infty, -2) \cup (2, +\infty)$ 10
 $x > -2$

$\Rightarrow D_f = ((-\infty, -2) \cup (2, +\infty)) - \{2\}$ $x \neq 2$

الف) $y = \sqrt{3 - \log_2(x-2)}$ $x-2 > 0 \Rightarrow x > 2$ 11
 $3 - \log_2(x-2) \geq 0$ $\log_2(x-2) \leq 3$ $x-2 \leq 8$ $x \leq 10$ $D_f = [2, 10]$

ب) $y = \log_2(2 \log_2 x - 1)$ $x > 0$ $2 \log_2 x - 1 > 0$ $\log_2 x > \frac{1}{2}$ $x > 2^{\frac{1}{2}}$ $D_f = (\sqrt{2}, +\infty)$ 15
 $2 \log_2 x - 1 \neq 0$

الف) $y = \frac{x}{x^2+1}$ $x \neq -1$ $D_f = \mathbb{R}$ 9

ب) $y = \frac{x}{x^2-1}$ $x \neq 1$ $x \neq -1$ $D_f = \mathbb{R} - \{1, -1\}$ 20

ج) $y = \frac{x}{x^2-2}$ $x \neq \sqrt{2}$ $D_f = \mathbb{R} - \{\log_2 \sqrt{2}\} = \mathbb{R} - \{\frac{1}{2}\}$

د) $y = \frac{x}{x^2-3}$ $x \neq \sqrt{3}$ $x \neq -\sqrt{3}$ $D_f = \mathbb{R} - \{\log_2 \sqrt{3}\}$

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الف) $y = (x+1)!$ $kx+1 \leq w$ $x \leq \frac{w-1}{k}$ $D_f = \{x \mid x = \frac{k-1}{k}, k \in w\}$ -1.

ب) $y = \left(\frac{wx-y}{y(x-a)} \right)!$ $\Rightarrow x = -\frac{-ax+y}{y\frac{w}{x}-w}$ $D_f = \{x \mid x = \frac{-ax+y}{-yk+w}, k \in w\}$ 1.1

5 $\log \frac{x^2 - 4x + 3}{x-3}$ $x-3 \neq 0$ $x^2 - 4x + 3$ $x-3$ $x \neq +3$ $\leftarrow$ سوال 1 قسمت الف

$(x-1)(x-3)$ $x-3$ $(+1)$ $(+3)$ $(+3) \leftarrow x-3$

$\frac{+1}{-} + \frac{+3}{+} +$ $[1, +\infty) - \{3\}$

$D_f = [1, +\infty) - \{3\}$

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