

سوال (1)

الف) $y = \frac{\sin x - 2}{2 \cos x + 1}$

$2 \cos x + 1 \neq 0$

$\cos x \neq -\frac{1}{2}$

$Df = \mathbb{R} - \{2k\pi - \frac{\pi}{3}, 2k\pi + \frac{5\pi}{3}\}$

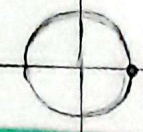


ب) $y = \frac{\sin x + 3}{\cos x - 1}$

$\cos x - 1 \neq 0$

$\cos x \neq 1$

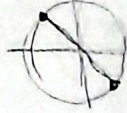
$Df = \mathbb{R} - \{2k\pi\}$



الف) $y = \frac{2 \sin x + 1}{\tan x + 1}$

$\tan x + 1 \neq 0$
 $\tan x \neq -1$

$Df = \mathbb{R} - \{k\pi + \frac{3\pi}{4}\}$



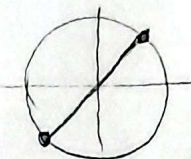
سوال (2)

ب) $y = \frac{\cos x + 1}{\cot x - 1}$

$\cot x - 1 \neq 0$

$\cot x \neq 1$

$Df = \mathbb{R} - \{k\pi + \frac{\pi}{4}\}$



سوال (3) الف) $\sin y = x^2 - 2 \quad -1 \leq x^2 - 2 \leq 1 \quad 1 \leq x^2 \leq 3 \quad \sqrt{1} \leq x \leq \sqrt{3}$

$Df = [1, \sqrt{3}]$

ب) $y = \arccos(\sqrt{x} - 2) \Rightarrow -1 \leq \sqrt{x} - 2 \leq 1 \Rightarrow 1 \leq \sqrt{x} \leq 3 \Rightarrow 1 \leq x \leq 9$ II

$\sqrt{x} \Rightarrow x \geq 0$ I $\Rightarrow Df = I \cap II = [1, 9]$

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

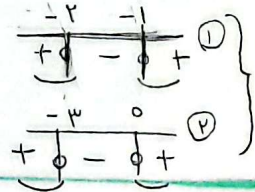
$Df = [2, 4] \cup [-4, -2]$

سوال (4)

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

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

② $x^2 + 3x + 1 \leq 1 \Rightarrow x(x+3) \leq 0$



$Df = ① \cap ② \Rightarrow Df = [-3, -2] \cup [-1, 0]$

الف) $y = \log_2(x^2 - 4)$

$x^2 - 4 > 0$

$x^2 > 4 \Rightarrow x > 2$

$Df = (2, +\infty)$

سوال (5)

ب) $y = \log_2(2 - |x|)$

$2 - |x| > 0$

$|x| < 2$

$-2 < x < 2$

$Df = (-2, 2)$

$$y = \log_{a-3}^{a-1} \quad a-1 > 0 \rightarrow a < \infty$$

$$a-3 > 0 \rightarrow a > 3$$

$$a-3 \neq 1 \rightarrow a \neq 4$$

سوال (4)

$$Df = (3, \infty) - \{4\}$$

ب) $y = \log_{a+3}^{a^2-1}$

$$a^2-1 > 0 \rightarrow a^2 > 1$$

$$a+3 > 0 \rightarrow a > -3$$

$$a+3 \neq 1 \rightarrow a \neq -2$$

$$Df = (-3, +\infty) - \{-2\}$$

سوال (7)

الف) $y = \log_{n-3} \frac{n^2 - 4n + 3}{n-3} \Rightarrow \frac{(n-1)(n-3)}{n-3} \Rightarrow \log(n-1) \rightarrow n-1 > 0$

$$n > 1 \quad Df = (1, +\infty)$$

ب) $y = \log_{n+5} \frac{n+2}{n-2}$

$$\frac{n+2}{n-2} > 0 \quad + \frac{-2}{0-\frac{2}{3}} +$$

$$n+5 > 0 \quad n > -5$$

$$n+5 \neq 1 \rightarrow n \neq -4$$

$$Df = (-\infty, -3) \cup (2, +\infty) - \{-4\}$$

الف) $y = \sqrt{3 - \log_2^{(n-2)}}$

$$n-2 > 0 \quad n > 2$$

$$3 - \log_2^{(n-2)} \geq 0 \rightarrow \log_2^{(n-2)} \leq 3 \rightarrow n-2 \leq 8$$

$$n \leq 10$$

$$Df = (2, 10]$$

سوال (8)

ب) $y = \log(2 \log_3^n - 1)$

$$n > 0$$

$$2 \log_3^n - 1 > 0 \quad \log_3^n > \frac{1}{2} \quad n > \sqrt{2}$$

$$Df = (\sqrt{2}, +\infty)$$

سوال (9)

الف) $y = \frac{3}{4n+1}$

$$4n+1 \neq 0 \quad 4n \neq -1 \rightarrow n \neq -\frac{1}{4}$$

$$Df = \mathbb{R}$$

ب) $y = \frac{3}{4n-1}$

$$4n-1 \neq 0 \quad 4n \neq 1 \rightarrow n \neq \frac{1}{4}$$

$$Df = \mathbb{R} - \{\frac{1}{4}\}$$

ج) $y = \frac{3}{4^n - 2}$

$$4^n - 2 \neq 0 \quad 4^n \neq 2 \quad n \neq \frac{1}{2}$$

$$Df = \mathbb{R} - \{\frac{1}{2}\}$$

د) $y = \frac{3}{4^n - 3}$

$$4^n - 3 \neq 0 \quad 4^n \neq 3 \quad n \neq \log_4 3$$

$$Df = \mathbb{R} - \{\log_4 3\}$$

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سفال ١٥

$$y = (f_{n+1})!$$

$$f_{n+1} \in W$$

$$f_n \in W-1 \quad n \in W-1$$

$$Df = \{n \mid n = \frac{k-1}{f}, k \in W\}$$

ب) $y = \left(\frac{f_n - r}{f_n - a} \right)!$

$$\frac{f_n - r}{f_n - a} \in W \quad f_n - r = r W n - a W$$

$$f_n - r W n = r - a W$$

$$n(f_n - r W) = r - a W$$

$$n = \frac{r - a W}{f_n - r W}$$

$$Df = \{n \mid n = \frac{r - a K}{f_n - r K}, K \in W\}$$