

الف) $\left[x - \frac{1}{x}\right] + \left[x + \frac{1}{x}\right] \geq 0$ (5)

$\left[x + \frac{1}{x} - 1\right] + \left[x + \frac{1}{x}\right] \geq 0 \rightarrow \left[x + \frac{1}{x}\right] - 1 + \left[x + \frac{1}{x}\right] \geq 0$

$\rightarrow 2\left[x + \frac{1}{x}\right] \geq 1 \rightarrow \left[x + \frac{1}{x}\right] \geq \frac{1}{2} \rightarrow x + \frac{1}{x} \geq 1$

$\rightarrow x \geq \frac{1}{x} = D_y$

ب) $\left[x - \frac{1}{x}\right] + \left[\frac{1}{x} - x\right] \geq 0$

$\rightarrow x - \frac{1}{x} \in \mathbb{Z} \rightarrow x \in \mathbb{Z} + \frac{1}{x}$

$D_y = \left\{x \mid x = k + \frac{1}{x}, k \in \mathbb{Z}\right\}$

الف) I: $\cot = \frac{\cos}{\sin} \rightarrow \sin \neq 0$ II: $\tan = \frac{\sin}{\cos} \rightarrow \cos \neq 0$ (6)

III: $\tan x + 1 \neq 0 \rightarrow \tan x \neq -1$

$D_y = \mathbb{R} - \left\{\frac{k\pi}{4}, k\pi - \frac{\pi}{4}\right\}$

ب) $1 - \sin^2 x \geq 0 \rightarrow \sin^2 x \leq \frac{1}{4} \rightarrow -\frac{1}{2} \leq \sin x \leq \frac{1}{2}$

$D_y = \left[\frac{k\pi - \frac{\pi}{6}}{4}, \frac{k\pi + \frac{\pi}{6}}{4}\right]$

الف) $2\sin x - 1 \geq 0 \rightarrow \sin x \geq \frac{1}{2} \rightarrow$

$D_y = \left[\frac{2k\pi + \frac{\pi}{6}}{4}, \frac{2k\pi + \frac{5\pi}{6}}{4}\right]$

ب) $1 - 2\cos x \geq 0 \rightarrow \cos x \leq \frac{1}{2}$

$D_y = \left[\frac{k\pi + \frac{\pi}{3}}{4}, \frac{2k\pi - \frac{\pi}{3}}{4}\right]$

انتهای بازه از انتهای آن نباید کوچکتر باشد!

PARAMOUNT

ب-ص) $1 - \cos x \geq 0 \rightarrow \cos x \leq \frac{1}{2} \rightarrow D_y = \left[\frac{2k\pi + \frac{\pi}{3}}{4}, \frac{2k\pi + \frac{5\pi}{3}}{4}\right]$

1 الف) $-1 \leq x^2 + 3x + 1 \leq 1 \xrightarrow{I} x^2 + 3x \leq 0 \rightarrow \frac{x}{x+1} \leq 0$ (A)
 $x \in [-3, 0]$
 2 $I \cap II \rightarrow [-3, -1] \cup [-1, 0]$
 3 $\cup [-1, 0]$

4 ب) $-1 \leq \sqrt{2-x} \leq 1 \rightarrow 0 \leq \sqrt{2-x} \leq 1$
 5 $\xrightarrow{C} 0 \leq 2-x \leq 1 \rightarrow 1 \leq x \leq 2 \rightarrow x \in [1, 2]$
 6 $Dg = [1, 2]$ (P)

7
 8 الف) I $x > 0$ II $1 - \log_3 x > 0 \rightarrow \log_3 x < 1 \rightarrow x < 3$ (9)
 9 $I \cap II \rightarrow (0, 3)$

10
 11 ب) I $x > 0$ II $1 - \log_{\frac{1}{2}} x > 0 \rightarrow \log_{\frac{1}{2}} x < 1 \rightarrow x > \frac{1}{2}$
 12 $I \cap II = (\frac{1}{2}, +\infty)$ (P)

13
 14 الف) $x^2 - x^2 - 2^x \geq 0 \rightarrow x - x^2 \geq 2 \rightarrow x^2 - x + 2 \leq 0$ (1.5)
 15 $\rightarrow (x-2)(x-1) \leq 0 \rightarrow \frac{x}{x-1} \leq 0 \quad Dg = [1, 2]$

16
 17 ب) $\frac{3x+d}{x+f} \in W \rightarrow x \in -\frac{fW-d}{3W-f}$ (P)

18
 19 $D_f = \left\{ x \mid x = -\frac{fK+d}{3K-f}, K \in W \right\}$

1 الف) $2x^3 + 3x^2 - 11x + 3 \neq 0$ بقسمة $\rightarrow (x-1)(2x^2 + 5x - 3) \neq 0$ ①

2 $\rightarrow (x-1)(2x-1)(x+3) \neq 0$ $D_y = \mathbb{R} - \{-3, \frac{1}{2}, 1\}$ ②

3 ب) $2x^3 + 9x^2 + 10x + 3 \neq 0$ بقسمة $\rightarrow (x+1)(2x^2 + 7x + 3) \neq 0$

4 $\rightarrow (x+1)(x+3)(2x+1) \neq 0 \rightarrow D_y = \mathbb{R} - \{-3, -\frac{1}{2}, -1\}$

5 الف) $x^3 - 2x^2 + 2x - 1 \neq 0$ بقسمة $\rightarrow (x-1)(x^2 - x + 1) \neq 0$ ②

7 $D_y = \mathbb{R} - \{1\}$ ③ حساب المشتقة

8 ب) $\sqrt{\frac{x+3}{x^3 - 2x^2 + 2x - 1}} = y$ $\frac{-3}{+ \infty} - \frac{1}{- \frac{1}{2}} +$ $D_y = (-\infty, -\frac{1}{2}] \cup (1, +\infty)$

10 $x^2 - 2|x-1| - 2x + 1 \neq 0$ $x \neq 2/5$ ③

11 $x \geq 1 \rightarrow x^2 - 2x + 2 - 2x + 1 \neq 0 \rightarrow x^2 - 4x + 3 \neq 0 \rightarrow (x-1)(x-3) \neq 0$

12 $x \leq 1 \rightarrow x^2 + 2x - 2 - 2x + 1 \neq 0 \rightarrow x^2 + 3x \neq 0 \rightarrow x(x+3) \neq 0 \rightarrow x \neq 0, -3$

13 $D_y = \mathbb{R} - \{-3, 0, 1, 3\}$ ④

14 الف) $[-x] - 2 \geq 0 \rightarrow [x] \geq 2 \rightarrow -x \geq 2 \rightarrow x \leq -2$ ⑤

16 $D_y = (-\infty, -2]$ ⑥

17 ب) $[x]^2 - 2[x] - 3 \neq 0 \rightarrow ([x] - 3)([x] + 1) \neq 0$

18 $\rightarrow D_y = (-\infty, -1) \cup [0, 3] \cup [4, +\infty)$

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