

مقطع: لایزدهم B صتر

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$$2x^2 + y^2 - 4x + 4y + k = 0 \Rightarrow 2(x-1)^2 + (y+2)^2 = k+11 \Rightarrow k+11 \geq 0 \rightarrow k \geq -11 \quad (1)$$

$$2x^2 - 4x + 2 + y^2 + 4y + 4 = k+11 \rightarrow$$

$$x = a \Rightarrow a^2 + 4a + 2 + a + 2 \rightarrow a^2 + 5a + 4 = 0 \rightarrow (a+1)(a+4) = 0 \rightarrow a = -1 \text{ or } a = -4$$

$$a = -1 \rightarrow \boxed{a = -1} \checkmark \quad F(1) = (1)^2 + 4(1) = 5$$

$$x+1 \leq -2 \rightarrow (-\infty, -3] \cup \{1\} \rightarrow D_f = (-\infty, -3] \cup [1, +\infty)$$

$$x+1 \geq 2 \rightarrow [1, +\infty) \quad (2)$$

$$(1) \cup (2) \cap [-3, -1] = \{-3\} \Rightarrow 2(-3)^2 - b + a + 2(-3) = 11 \rightarrow 11 - b + a - 6 = 5 \rightarrow a - b = 0 \rightarrow a = b$$

$$y \geq \sqrt{12-a} + \sqrt{b-4} \Rightarrow \begin{cases} 12-a \geq 0 \rightarrow 12 \geq a \\ b-4 \geq 0 \rightarrow b \geq 4 \end{cases} \quad \frac{b}{a} = \frac{4}{12} = \frac{1}{3} \quad (3)$$

$$\frac{x+1}{|x-3|} \geq 0 \rightarrow |x-3| \neq 0 \rightarrow x-3 \neq 0 \rightarrow x \neq 3$$

$$x+1 \geq 0 \rightarrow x \geq -1 \rightarrow D_f = [-1, +\infty) - \{3\} \quad (4) \quad D_f = [-1, 3) \cup (3, +\infty)$$

$$\frac{4-x}{x^2+2x+5} \geq 0 \rightarrow x^2+2x+5 \rightarrow \Delta = 4-20 = -16 < 0 \rightarrow \Delta < 0 \rightarrow \text{no real roots}$$

$$4-x \geq 0 \rightarrow 4 \geq x \Rightarrow x \leq 4 \rightarrow (1) \cap (2) = [-1, 4] - \{3\} \rightarrow D_f = [-1, 3) \cup (3, 4]$$

$$b) \sqrt{[x]-4} + \sqrt{2-[x]} \rightarrow [x]-4 \geq 0 \rightarrow [x] \geq 4 \rightarrow x \geq 4$$

$$\rightarrow 2-[x] \geq 0 \rightarrow [x] \leq 2 \rightarrow x \leq 2 \quad (II)$$

$$a) \frac{x^2-x-6}{(x^2-4)(x-9)} \geq 0 \Rightarrow \frac{x}{1+\frac{-3}{x}-\frac{1}{x}+\frac{1}{x}+\frac{1}{x}+\frac{1}{x}} \quad D_f = (-\infty, -3) \cup (3, 4) \cup (9, +\infty) \quad (5)$$

$$b) \frac{x^3-2x^2-2x+4}{x^3+2x^2-2x-4} \geq 0 \rightarrow \frac{(x-1)(x-2)(x+2)}{(x-2)(x+1)(x+2)} \geq 0 \rightarrow \frac{x-1}{x+1} \geq 0$$

$$D_f = (-\infty, -3) \cup [-2, -1) \cup [1, 2) \cup [3, +\infty)$$

$$a) \sqrt{[-x]-2} \Rightarrow [-x]-2 \geq 0 \rightarrow [-x] \geq 2 \rightarrow -x \geq 2 \rightarrow x \leq -2$$

$$D_f = (-\infty, -2]$$

$$\frac{\omega x + 1}{\{x\}^2 - 2\{x\} - 3} \geq 0 \Rightarrow D_f = \{x \mid x \in (-1, 0) \cup (3, 4)\}$$

$$(\{x\} - 3)(\{x\} + 1)$$

$$\{x\} \geq 3 \Rightarrow x \in [3, 4) \quad \{x\} \leq -1 \Rightarrow x \in [-1, 0)$$

1, 1, 0

الف) $\frac{\cot x + 1}{\tan x + 1} \geq 0 \Rightarrow \begin{cases} \tan x \neq -1 \rightarrow x \neq K\pi - \frac{\pi}{4} \\ \sin x \neq 0 \rightarrow K\pi \\ \cos x \neq K\pi + \frac{\pi}{2} \end{cases}$ (A)

$$D_f = \mathbb{R} - \left\{ K\pi - \frac{\pi}{4}, K\pi + \frac{\pi}{2}, K\pi \right\}$$

ب) $\sqrt{1 - \epsilon \sin^2 x} \geq 0$

$$\rightarrow 1 - \epsilon \sin^2 x \geq 0 \rightarrow -\epsilon \sin^2 x \geq -1 \rightarrow \epsilon \sin^2 x \leq 1$$

$$\sin^2 x \leq \frac{1}{\epsilon} \rightarrow \frac{1}{\sqrt{\epsilon}} \leq \sin x \leq \frac{1}{\sqrt{\epsilon}}$$

$$D_f = \left[K\pi - \frac{\pi}{4}, K\pi + \frac{\pi}{4} \right]$$

ج) $y = \sqrt{1 - \log \frac{x-1}{\frac{1}{4}}} \geq 0 \rightarrow 1 - \log \frac{x-1}{\frac{1}{4}} \geq 0 \rightarrow \log \frac{x-1}{\frac{1}{4}} \leq 1 \rightarrow x-1 \leq \frac{1}{4} \rightarrow x \leq \frac{5}{4}$ (4)

$$\rightarrow x-1 > 0 \rightarrow x > 1 \quad (II) = (I) \cap (II) = \left[\frac{5}{4}, +\infty \right)$$

د) $\frac{\sqrt{x^2 - x}}{1 - (\log)_f x^2 - 3x} \geq 0 \rightarrow (\log)_f x^2 - 3x \neq 1$

$$x^2 - x \geq 0 \quad x^2 - 3x \neq 4$$

$$x(x-1) \geq 0 \quad x^2 - 3x - 4 \neq 0$$

$$(x-4)(x+1) \neq 0 \Rightarrow x \neq 4, x \neq -1$$

$$x \neq 4 \Rightarrow D_f = (-\infty, -1) \cup (-1, 0) \cup (3, 4) \cup (4, +\infty)$$

هـ) $\sqrt{x^2 - x^2 - 1} \geq 0 \rightarrow x^2 - x^2 - 1 \geq 0 \rightarrow -1 \geq 0$ (1)

$$D_f = [1, 3]$$

و) $\frac{wx + d}{rx + f} \in W$

$$wx + d = rxw + fw$$

$$\hookrightarrow wx - rxw = fw - d$$

$$\Rightarrow \left\{ x \mid x = \frac{Kd - d}{r - rK}, K \in W \right\}$$