

$$x^2 + y^2 - 4x + 4y + 4 = 0 \quad k = t + 2$$

$$(x^2 - 4x + 4) + (y^2 + 4y + 4) = 0 \quad k = t + 2 = 4 + 2 = 11$$

تقریباً:  $\Delta = 0$   $14 - 4(1)(t) = 0$   $t = 2$   $\Delta = 0$   $14 - 4(2) = 0$   $2 = 9$

تقریباً:  $(x^2 - 4x + 4)(y^2 + 4y + 4) = 0$   $\Rightarrow$   $(x-2)^2(y+2)^2 = 0$   $\Rightarrow$   $x=2$   $y=-2$

$$f(x) = \begin{cases} x^2 + 2x & x \geq a \\ x^2 + a + 2 & x \leq a \end{cases}$$

در  $x=a$  پیوسته است  $\Rightarrow$   $a^2 + 2a = a^2 + a + 2 \Rightarrow a = 2$

$$f(1) = (1)^2 + 2(1) = 5$$

$$f(x) = \begin{cases} x^2 - b & |x+1| \geq 2 \\ a + 2x & -2 \leq x \leq -1 \end{cases}$$

در  $x=-2$  پیوسته است  $\Rightarrow$   $2(-2)^2 - b = a + 2(-2) \Rightarrow 18 - b = a - 4 \Rightarrow a + b = 22$

$$y = \sqrt{4x-a} + \sqrt{b-3x}$$

$$\frac{a}{4} = \frac{b}{3} \Rightarrow \frac{b}{a} = \frac{3}{4} \Rightarrow \frac{a}{b} = \frac{4}{3}$$

$$\begin{cases} 4x - a \geq 0 \\ b - 3x \geq 0 \end{cases} \Rightarrow \begin{cases} x \geq \frac{a}{4} \\ x \leq \frac{b}{3} \end{cases}$$

$$I \cap II = D: [-1, 4] - \{2\}$$

$$y = \sqrt{x-1} + \sqrt{1-x}$$

$$I \cap II = D: \emptyset$$

الف)  $y = \sqrt{\frac{x^2 - x - 4}{x^2 - 10x + 24}}$   $\xrightarrow{\text{ت.ت.}}$   $\frac{(x-3)(x+1)}{x^2 - 10x + 24} \geq 0$   $\frac{(x-3)(x+1)}{(x-4)(x-6)} \geq 0$   $x \in \mathbb{R}$

$D: (-\infty, -1) \cup (3, +\infty) - \{4\}$

ب)  $y = \sqrt{\frac{x^2 - 2x - 3}{x^2 + 2x - 8}}$   $\xrightarrow{\text{ت.ت.}}$   $\frac{(x-3)(x+1)}{(x+4)(x-2)} \geq 0$   $x \in \mathbb{R}$

$D: (-\infty, -1) \cup [1, +\infty) - \{-2, 4\}$

الف)  $y = \sqrt{-x} - 2$   $[-x] - 2 \geq 0$   $[-x] \geq 2$   $x \leq -2$   $D: (-\infty, -2]$

ب)  $y = \frac{x^2 + 4}{x^2 - 2x - 3}$   $[x]^2 - 2[x] - 3 \neq 0$   $[x] \neq 3$   $[x] \neq -1$   $D: \mathbb{R} - [3, 4) \cup [1, 0)$

الف)  $y = \frac{\cot x + 1}{\tan x + 1}$   $\cos x \neq 0$   $\sin x \neq 0$   $\tan x \neq -1$   $D: \mathbb{R} - \{k\pi, k\pi - \frac{\pi}{2}\}$

ب)  $y = \sqrt{1 - \sin^2 x}$   $1 - \sin^2 x \geq 0$   $\sin^2 x \leq 1$   $-\frac{1}{\sqrt{2}} \leq \sin x \leq \frac{1}{\sqrt{2}}$   $D: [k\pi - \frac{\pi}{4}, k\pi + \frac{\pi}{4}]$

الف)  $y = \sqrt{1 - \log_{\frac{1}{2}} x - 1}$   $x - 1 > 0$   $x > 0$   $1 - \log_{\frac{1}{2}} x - 1 \geq 0$   $* D: [\frac{1}{2}, +\infty)$

ب)  $y = \frac{\sqrt{x^2 - x}}{1 - \log_{\frac{1}{2}} x - x}$   $x^2 - x \geq 0$   $x - 1 \geq \frac{1}{x}$   $x \geq \frac{1}{x}$   $x^2 - x > 0$   $x \neq 0$   $x \neq 1$   $x \neq -1$   $D: (-\infty, 0) \cup (1, +\infty) - \{1, -1\}$

الف)  $y = \sqrt{1 - \log_{\frac{1}{2}} x - x}$   $1 - \log_{\frac{1}{2}} x - x \geq 0$   $x - 1 \geq \frac{1}{x}$   $x \geq \frac{1}{x}$   $x^2 - x > 0$   $x \neq 0$   $x \neq 1$   $x \neq -1$   $* D: [1, 4]$

ب)  $y = \left(\frac{x + \omega}{x + \omega}\right)!$   $\frac{x + \omega}{x + \omega} \in \mathbb{N}$   $x = -\frac{\omega - \omega}{\omega - \omega}$

\*  $D: \{x | x = \frac{-k\omega + \omega}{\omega - \omega}, k \in \mathbb{N}\}$