

$$2x^2 + y^2 - 5x + 4y + k = 0 \quad (تابع ناخطی) \quad k = ? \quad (11)$$

$$2x^2 - 5x + y^2 + 4y + k = 0$$

$$2(x^2 - \frac{5}{2}x) + (y^2 + 4y) - 9$$

$$\rightarrow (x-1)^2 - 1$$

$$2(x-1)^2 - 2$$

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

$$2(x-1)^2 + (y+2)^2 = 0$$

$$f(x) = \begin{cases} x^2 + 4x; & x \geq a \\ 2x + a + 2; & x \leq a \end{cases} \quad \begin{matrix} f(1) = ? \\ a > 0 \\ a = 1 \text{ مثلا} \end{matrix}$$

$$\Rightarrow 1 + 4 = 2 + a + 2$$

$$a = 1$$

$$f(1) = \begin{cases} \omega & 1 > a \\ a + 2 & a \geq 1 \end{cases} \Rightarrow \begin{matrix} f(1) = \omega \\ f(1) = a + 2 \end{matrix}$$

$$f(x) = \begin{cases} 2x^2 - b; & |x+1| \geq 2 \\ a + 2x; & -3 \leq x \leq 1 \end{cases} \quad \begin{matrix} a+b = ? \\ x+1 \geq 2 \rightarrow x \geq 1 \\ x+1 \leq -2 \rightarrow x \leq -3 \end{matrix}$$

$$x=1 \quad 1) \quad 2x^2 - b = a + 2x \Rightarrow a+b=0$$

$$x=-3 \quad 2) \quad 2x^2 - b = a + 2x \Rightarrow a+b=12$$

$$y = \sqrt{4x-a} + \sqrt{b-3x} \quad Dy = \{r\} \quad \frac{b}{a} = ? \quad \frac{1}{r}$$

$$\begin{matrix} 4x-a \geq 0 & b-3x \geq 0 \\ 4x \geq a & b \geq 3x \end{matrix} \quad \frac{4}{12} = \frac{1}{r}$$

$$y = \sqrt{\frac{x+1}{|x-3|}} + \sqrt{\frac{4-x}{x^2+2x+5}} \quad \Rightarrow y = \sqrt{[x]-4} + \sqrt{2-[x]}$$

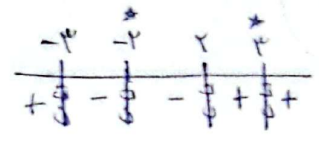
$$[x]-4 \geq 0 \quad 2-[x] \geq 0$$

$$[x] \geq 4 \quad [x] \leq 2 \rightarrow x \leq 2 \rightarrow x < 3$$

$$D_f = (-\infty, 4) \cup [-1, 4) \cup (-\infty, 3) \cup [4, +\infty)$$

الف) $y = \sqrt{\frac{x^2 - x - 6}{x^2 - 13x^2 + 36}}$

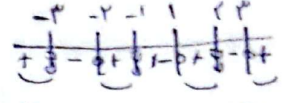
$(x-3)(x+2)$
 $(x^2-4)(x^2-9)$



$D_f = (-\infty, -3) \cup (-2, 3) \cup (4, +\infty)$

ب) $y = \sqrt{\frac{x^2 - 2x^2 - 3x + 4}{x^2 + 2x^2 - 3x - 4}}$

$(x-1)(x-3)(x+2)$
 $(x+1)(x+2)(x-4)$



$D_f = (-\infty, -4) \cup (-3, -2) \cup (-1, 1) \cup (2, 3) \cup (4, +\infty)$

الف) $y = \sqrt{-x} - 2$

$-x - 2 \geq 0$

$-x \geq 2$

$x \leq -2$

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

ب) $y = \frac{\Delta x^2 + 9}{x^2 - 2x - 3}$

$x^2 - 2x - 3 > 0$

$(x-3)(x+1) > 0$

$x < -1$ or $x > 3$

$D_f = R - \{[3, \infty) \cup [-1, 0]\}$

الف) $y = \cot x + 1$

$\tan x \neq -1$

1) $2k\pi + \frac{\pi}{4} \leq x < 2k\pi + \pi$

2) $2k\pi \leq x < 2k\pi - \frac{\pi}{4}$

$D_f = [2k\pi, 2k\pi + \pi) \cup [2k\pi, 2k\pi - \frac{\pi}{4})$



ب) $y = \sqrt{1 - \epsilon \sin^2 x}$

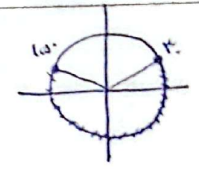
$1 - \epsilon \sin^2 x \geq 0$

$\epsilon \sin^2 x \leq 1$

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

$\sin x \leq \frac{1}{\sqrt{\epsilon}}$

$D_f = [2k\pi + \frac{\pi}{4}, 2k\pi + \pi - \frac{\pi}{4}]$



الف) $y = \sqrt{1 - \log \frac{x-1}{x}}$

$1 - \log \frac{x-1}{x} \geq 0$

$\log \frac{x-1}{x} \leq 1 \Rightarrow x-1 \leq \frac{1}{x} \Rightarrow x \leq \frac{x}{x-1}$

$D_f = 1 < x \leq \frac{x}{x-1} \quad (1, \frac{x}{x-1}]$

ب) $y = \sqrt{\frac{x^2 - x}{1 - \log \frac{x^2 - 3x}{x}}}$

$\frac{x^2 - x}{1 - \log \frac{x^2 - 3x}{x}} \geq 0$

$1 - \log \frac{x^2 - 3x}{x} > 0 \Rightarrow \log \frac{x^2 - 3x}{x} < 1$

$D_f = R - \{[0, 1] \cup [1, 2]\} \cup (-\infty, 0) \cup (2, +\infty)$

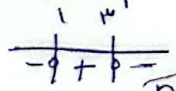
الف) $y = \sqrt{\frac{x^2 - x^2}{x^2 - 1}}$

$\frac{x^2 - x^2}{x^2 - 1} \geq 0$

$x^2 - 1 \geq 0$

$x \leq -1$ or $x \geq 1$

$-(x-1)(x+1) \geq 0$



$D_f = [1, 2]$

ب) $y = (\frac{x^2 + \omega}{x^2 + \epsilon})!$

$\frac{x^2 + \omega}{x^2 + \epsilon} \in \omega \Rightarrow x \in \frac{\omega \omega + \omega}{\omega \omega + \epsilon}$

$x \in \frac{-\epsilon \omega + \omega}{\omega \omega - \epsilon}$

$D_f = \{x \mid x \in \frac{-\epsilon k + \omega}{\omega k - \epsilon}, k \in \omega\}$