

سوال ۱

$$x^2 + y^2 - 6x + 4y + K = 0$$

$$y^2 + 4y + K = 0$$

$$K = 0$$

$$x^2 - 6x + K_1 = 0 \rightarrow K_1 = 9$$

$$(y+2)^2 = K_2 + 4$$

$$(x-3)^2 = x^2 - 6x + 9$$

$$K_1 + K_2 = 9 + 4 = 13$$

سوال ۲

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

$$a^2 + 4a + 2a + 2 = 0$$

$$a^2 + 6a - 2 = 0$$

$$a^2 + 6a - 2 = 0 \rightarrow (a+2)(a-1) = 0$$

$$a = 1$$

$$(a > 0)$$

$$f(1) = (1)^2 + 2(1) = 3$$

$$f(1) = 3 = 0$$

سوال ۳

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

$$|x| \geq 2 \rightarrow x \geq 2$$

$$|x| \leq 2 \rightarrow x \leq -2$$

$$a + b = 0$$

$$f(x) = -2$$

$$f(-2) = b = a + 2(-2)$$

$$1 - b = a - 4 \rightarrow 1 + 4 = 2a \rightarrow a = 2.5$$

سوال ۴

$$y = \sqrt{4x-9} + \sqrt{b-2x}$$

$$12 - a = 0 \rightarrow a = 12$$

$$b - 9 = 0 \rightarrow b = 9$$

$$\frac{b}{a} = \frac{9}{12} = \frac{3}{4}$$

$$Dy = [1, 2] \quad \frac{b}{a} = \frac{3}{4}$$

سوال ۵

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

$$\frac{-1}{1+3} = -\frac{1}{4}$$

$$\frac{4}{1+1} = 2$$

$$\frac{-1}{1+1} = -\frac{1}{2}$$

$$Dy = [1, 2) \cup (2, 4]$$

$$y = \sqrt{[x]-2} + \sqrt{2-[x]}$$

$$Dy = \emptyset$$

$$\frac{2}{1} = 2$$

$$[x] \geq 2 \rightarrow x \geq 2 \quad 2 - [x] \geq 0 \rightarrow [x] \leq 2 \rightarrow 2 \leq x < 3$$

$$(\sqrt{m} - \sqrt{r})^2 \cdot (u - 1)^2$$

مسألة ٤

$$a) \sqrt{\frac{x^2 - x - 4}{x^2 - 13x + 44}} \Rightarrow \frac{(x-3)(x+4)}{x^2 - 13x + 44} =$$

$$\frac{(x-3)(x+4)}{x^2 - 13x + 44} =$$

$$x^2 + 4 \rightarrow x = \pm 2$$

$$x^2 - 9 \rightarrow x = \pm 3$$

$$a(t-5)(t-9)$$

$$\leftarrow \textcircled{+4} \textcircled{-9}$$

$$(-\infty, -4) \cup (-4, -9) \cup (-9, \infty)$$

$$\frac{-4}{+} \frac{-9}{-} \frac{+}{-} \frac{+}{-}$$

$$b) \sqrt{\frac{x^2 - 2x^2 - 3x + 4}{x^2 - 2x^2 - 3x - 4}}$$

$$\Rightarrow \frac{(x-1)(x-3)(x+2)}{(x+1)(x-3)(x-2)}$$

$$\frac{-4}{+} \frac{-2}{-} \frac{-1}{-} \frac{+}{-} \frac{+}{-}$$

$$D(f) = (-\infty, -2) \cup [-2, -1) \cup [1, 2) \cup [2, \infty)$$

$$c) \sqrt{[-x] - 2}$$

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

$$[-x] \geq 2$$

$$-x \geq 2$$

$$x \leq -2$$

$$D(f) = (-\infty, -2]$$

مسألة ٥

$$d) \frac{2x^2 + 4x}{[x]^2 - 2[x] - 3} \neq 0$$

$$([x] - 3)([x] + 1)$$

$$[x] + 3$$

$$[3, 6)$$

$$[x] + 1$$

$$[-1, 0)$$

$$D(f) = (-\infty, -1) \cup [-1, 3) \cup [6, \infty)$$

$$e) \frac{\cot x + 1}{\tan x + 1}$$

$$\frac{\cos}{\sin} + 1$$

$$\frac{\cos}{\sin} \neq -1 \Rightarrow \sin \neq 0$$

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

$$\rightarrow \tan x \neq -1 \rightarrow R - \left\{ x\pi + \frac{\pi}{2} \right\}$$

$$\cos \neq 0$$

$$\rightarrow R$$

$$\rightarrow R - \left\{ \frac{\pi}{2}, \frac{3\pi}{2} \right\}$$

مسألة ٦

$$f) \sqrt{1 - \sin^2 x}$$

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

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

$$\left[k\pi - \frac{\pi}{2}, k\pi + \frac{\pi}{2} \right]$$

$$\sin^2 x \leq \frac{1}{4} \rightarrow -\frac{1}{2} \leq \sin x \leq \frac{1}{2}$$

$$g) \sqrt{1 - \log_{\frac{1}{4}}^{n-1}}$$

$$1 - \log_{\frac{1}{4}}^{n-1} \geq 0$$

$$\log_{\frac{1}{4}}^{n-1} \leq 1 \rightarrow n-1 \leq \frac{1}{\frac{1}{4}} \rightarrow n \leq \frac{5}{4}$$

$$n-1 \geq 0 \rightarrow n \geq 1$$

$$\text{النسبة}$$

$$\left[\frac{5}{4}, +\infty \right)$$

$$h) \sqrt{\frac{x^2 - 4}{1 - \log_{\frac{1}{4}}^{x^2 - 4m}}}$$

$$x^2 - 4 \geq 0$$

$$x(x-2) \geq 0$$

$$\frac{1}{+1-1+}$$

$$\log_{\frac{1}{4}}^{x^2 - 4m} \neq 0$$

$$\neq 4$$

$$x^2 - 4m \neq 4 \rightarrow x \neq \pm 2\sqrt{m+1}$$

$$x^2 - 4m - 4 \neq 0 \rightarrow (x-2)(x+2)$$

$$x^2 - 4m \geq 0 \rightarrow \frac{0}{+1-1+}$$

$$(-\infty, 0) \cup (2, +\infty) - \{-1, 1\}$$

$$1) \sqrt{\frac{\epsilon x - x^2}{-1}}$$

$$[1, 3]$$

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

$$\frac{1}{+} \frac{x}{-} \frac{3}{+}$$

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

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

$$(x-3)(x-1) \leq 0$$

$$\rightarrow y \left(\frac{\epsilon x + \delta}{\epsilon x + \epsilon} \right)$$

$$\left\{ x \mid x \geq \frac{\epsilon x + \delta}{\epsilon - \epsilon x}, x \in W \right\}$$

$$\frac{\epsilon x + \delta}{\epsilon x + \epsilon} \in W$$

$$x \in \frac{\epsilon W - \delta}{\epsilon - \epsilon W}$$

$$\epsilon x + \delta \in \epsilon W + \epsilon W$$

$$\epsilon x - \epsilon x W \in \epsilon W \rightarrow$$

$$\leftarrow x(\epsilon - \epsilon W) \in \epsilon W$$