

$$(\sqrt{x} - \sqrt{2})^2 + (y+3)^2 = 0 \rightarrow x^2 - 4x + 2 + y^2 + 6y + 9 = 0$$

$$\boxed{K = 2+9=11} \leftarrow$$

$$a^2 + 4a = 3a + 2 \rightarrow a^2 + a - 2 = 0 \rightarrow (a+2)(a-1) = 0 \rightarrow a = -2 \text{ و } 1$$

✓ محقق

$$\text{اگر } x \geq 1 \rightarrow x^2 + 4x \rightarrow \boxed{1+4=5}$$

$$\text{اگر } |x+1| \geq 2 \rightarrow x \geq 1 \text{ یا } x \leq -3 \rightarrow 1a-b = a-4 \rightarrow \boxed{a+b=24}$$

$$4a - a = 3a - b = 0 \rightarrow \text{اگر } x=2 \rightarrow \underline{a=12} \text{ و } \underline{b=4} \rightarrow \boxed{\frac{b}{a} = \frac{1}{3}}$$

الف) $\frac{x+1}{|x-3|} \geq 0 \rightarrow \frac{-1}{x-3} + \frac{3}{x-3} \geq 0$ و $\frac{4-x}{x^2+2x+4} \geq 0 \rightarrow \boxed{x < 4} \text{ II}$

$[-1, +\infty) - \{3\} \text{ I}$ $\Delta < 0$ و $a > 0$ $\Rightarrow \text{همواره مثبت}$ $\Rightarrow \boxed{I \cap II = [-1, 4] - \{3\}}$

ب) $[x] - 4 \geq 0 \rightarrow [x] \geq 4 \rightarrow \boxed{x \geq 4} \text{ I}$ و $1 - [x] \geq 0 \rightarrow [x] \leq 1 \rightarrow \boxed{x < 2} \text{ II}$

$\Rightarrow \boxed{D_f = I \cap II = \emptyset}$

الف) $\frac{(x-3)(x+2)}{(x^2-9)(x^2-5)} \geq 0 \rightarrow \frac{-3 \quad -2 \quad 2 \quad 3}{+ \quad - \quad - \quad +} \rightarrow D_f = (-\infty, -3) \cup (2, 3) \cup (3, +\infty)$

ب) $\frac{(x-1)(x-3)(x+2)}{(x+1)(x+3)(x-2)} \geq 0 \rightarrow \frac{-1 \quad -2 \quad -1 \quad 1 \quad 2 \quad 3}{+ \quad - \quad - \quad - \quad + \quad -} \rightarrow D_f = (-\infty, -3) \cup [-2, -1) \cup [1, 2) \cup [3, +\infty)$

الف) $[-x] - 2 \geq 0 \rightarrow [-x] \geq 2 \rightarrow -x \geq 2 \rightarrow x \leq -2 \rightarrow D_f = (-\infty, -2]$

ب) $([x] - 3)([x] + 1) \neq 0 \rightarrow D_f = \mathbb{R} - [3, 4) \cup [-1, 0)$

الف) $\mathbb{R} - \left\{k\pi + \frac{3\pi}{4}, \frac{k\pi}{2}\right\} \xrightarrow{\text{نیز}} \tan x \neq -1, \cot x \rightarrow \left[\begin{array}{l} \text{در } \pi \text{ و } 2\pi \text{ تعریف نشده است} \\ \tan x \rightarrow \left[\begin{array}{l} \frac{\pi}{2} \text{ و } \frac{3\pi}{2} \text{ تعریف نشده} \end{array} \right] \end{array} \right.$

ب) $1 - \sqrt{5} \sin^2 x \geq 0 \rightarrow \sin^2 x \leq \frac{1}{5} \rightarrow -\frac{1}{\sqrt{5}} \leq \sin x \leq \frac{1}{\sqrt{5}} \rightarrow \frac{\frac{\pi}{9}}{\frac{\sqrt{5}}{9}} \rightarrow \frac{\pi}{9}$
 $D_f = \left[k\pi - \frac{\pi}{9}, k\pi + \frac{\pi}{9} \right]$

الف) $x-1 > 0 \rightarrow x > 1$ (I) و $1 - \log \frac{x-1}{x} \geq 0 \rightarrow \log \frac{x-1}{x} \leq 1$

$D_f = I \cap II = [1, 5 + \infty)$ (II) $x \geq \frac{3}{x} \leftarrow x-1 \geq \frac{1}{x}$

ب) $x(x-1) \geq 0 \rightarrow \frac{0}{+ \quad - \quad - \quad +} \rightarrow \mathbb{R} - (0, 1)$ (I), $x(x-3) > 0 \rightarrow \frac{0}{+ \quad - \quad - \quad +} \rightarrow \mathbb{R} - [0, 3]$ (II)
 $x^2 - 3x \neq 4 \leftarrow \log \frac{x^2-3x}{4} \neq 1$
 $\hookrightarrow x^2 - 3x - 4 \neq 0 \rightarrow x \neq 4, -1$ (III) $\rightarrow I \cap II \cap III = \mathbb{R} - [0, 3] - \{4, -1\}$

الف) $\frac{x^2 - x^3}{x^2 - 3} \geq 0 \rightarrow \frac{x^2 - x^3}{x^2 - 3} \geq \frac{3}{x^2} \rightarrow x^2 - x^3 \geq 3 \rightarrow x^2 - 3x + 3 \leq 0$
 $D_f = [1, 3] \leftarrow \frac{1}{+ \quad - \quad - \quad +} \leftarrow (x-1)(x-3) \leq 0$

ب) $\frac{3x+5}{x^2+4} \in W \rightarrow \frac{-5W+5}{-2W+3} \in W \rightarrow \left\{ x = \frac{-5W+5}{-2W+3} \mid W \in W \right\}$