

تکلیف است

بسیار مهم و ضروری

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$$x^2 + y^2 - 2x + 4y + k = 0 \xrightarrow{\text{مکمل کنیم}} x(x-2) + (y+2)^2 - 4 + k = 0$$

$$\Rightarrow x(x-1) - x + (y+2)^2 - 4 + k = 0 \xrightarrow{\text{مکمل کنیم}} x(x-2) + (y+2)^2 = 4 - k \Rightarrow \underline{k = 11}$$

$$\text{if } x = a \rightarrow a^2 + fa = 2a + a + 2 \Rightarrow a^2 + a - 2 = 0$$

$$(a-1)(a+2) = 0 \Rightarrow f(1) = 1 + 2 = \underline{3}$$

$$\sqrt{a=1} \leftarrow \begin{cases} a = -2 \times (a > 0) \end{cases}$$

$$|x+1| \geq 2 \begin{cases} x \geq 1 \\ x \leq -3 \end{cases}$$

$$\Rightarrow f(x) = \begin{cases} x^2 - b & ; x \geq 1 \cup x \leq -3 \\ a + 2x & ; -3 \leq x \leq -1 \end{cases}$$

$$\text{if } x = -3 \rightarrow 11 - b = a - 4 \Rightarrow a + b = \underline{15}$$

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

$$\downarrow$$

$$4x \geq a \Rightarrow x \geq \frac{a}{4}$$

$$b - 3x \geq 0 \Rightarrow x \leq \frac{b}{3}$$

$$D = \{x\} \Rightarrow \frac{a}{4} = \frac{b}{3} = 1$$

$$\begin{cases} a = 4 \times 1 = 4 \\ b = 3 \times 1 = 3 \end{cases} \Rightarrow \frac{b}{a} = \frac{3}{4} = \frac{1}{\frac{4}{3}}$$

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

$$\begin{matrix} x=3 & x=-1 & x=4 \end{matrix}$$

$$\textcircled{1} \frac{-1}{-1+3} \rightarrow [1, +\infty) - \{3\}$$

$$\textcircled{2} \frac{-3}{-3+3} \rightarrow (-\infty, 4] - \{-1\}$$

$$\Rightarrow \frac{-1}{-1+3} \rightarrow D = [-1, 4] - \{3\}$$

$$\text{ب)} y = \sqrt{x-2} + \sqrt{2-x}$$

$$\textcircled{1} [x] - 2 \geq 0 \rightarrow [x] \geq 2 \Rightarrow [2, +\infty)$$

$$\textcircled{2} 2 - [x] \geq 0 \rightarrow [x] \leq 2 \Rightarrow (-\infty, 2]$$

$$\Rightarrow D = \emptyset$$

$$y = \sqrt{\frac{x^2 - x - 4}{x^2 - 11x^2 + 44}} \rightarrow \frac{(x-4)(x+1)}{(x^2-4)(x^2-11)} = \frac{(x-4)(x+1)}{(x-2)(x+2)(x-3)(x+3)} \geq 0$$

$$\frac{-4}{+} \frac{-1}{-} \frac{+}{-} \frac{+}{+} \Rightarrow D = (-\infty, -3) \cup (2, 3) \cup (3, +\infty)$$

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

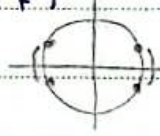
$$D = (-\infty, -3) \cup (-1, 1) \cup (2, 3) \cup (3, +\infty)$$

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

$$y = \frac{2x^2 + 4}{[x]^2 - 2[x] - 3} \rightarrow \frac{([x]-3)([x]+1)}{([x], f) \quad [-1, 0)} \neq 0 \Rightarrow D = \mathbb{R} - \{[x, f) \cup [-1, 0)\}$$

$$y = \frac{\cot x + 1}{\tan x + 1} \quad \textcircled{1} \sin \neq 0 \quad \textcircled{2} \tan x + 1 \neq 0 \quad D = \mathbb{R} - \left\{ \frac{k\pi}{\pi}, k\pi - \frac{\pi}{4} \right\}$$

$$y = \sqrt{1 - \sin^2 x} \geq 0 \Rightarrow \sin^2 x \leq \frac{1}{4} \Rightarrow -\frac{1}{2} \leq \sin x \leq \frac{1}{2}$$



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

$$y = \sqrt{1 - \log \frac{x-1}{x}} \geq 0 \rightarrow \textcircled{1} x-1 \geq 0 \quad \textcircled{2} \log \frac{x-1}{x} \leq 1 \quad 0 < b < 1 \rightarrow x-1 \geq (\frac{1}{x})^1 \Rightarrow x \geq \frac{x}{x}$$

$$D = [\frac{x}{x}, +\infty)$$

$$y = \frac{\sqrt{x^2 - x}}{1 - \log \frac{x^2 - x}{x}} \quad \textcircled{1} x^2 - x \geq 0 \rightarrow x(x-1) \geq 0 \quad \textcircled{2} x^2 - x > 0 \rightarrow x(x-1) > 0$$

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

$$y = \frac{x^2 - x^2}{x^2 - x^2} - 1 \geq 0 \rightarrow \frac{x^2 - x^2}{x^2 - x^2} \geq 1 \Rightarrow -x^2 + x \geq 1 \Rightarrow -x^2 + x - 1 \geq 0$$

$$(-1, 1) \Rightarrow (x-3)(x-1) \leq 0 \Rightarrow \frac{+}{-} \frac{-}{+} \Rightarrow D = [1, 3]$$

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$$y = \frac{x^2 + 2}{x^2 + 2} \in \mathbb{W} \Rightarrow x = -\frac{f(x) - d}{f(x) - p} = \frac{-\varepsilon x + d}{f(x) - p} \Rightarrow D = \left\{ x \mid x = \frac{-f(x) + d}{f(x) - p}, x \in \mathbb{W} \right\}$$