

$$A = \{1, 2, 3\}$$

$$B = \{2, 3\} \rightarrow A \times B = \{(1, 2)(1, 3)(2, 2)(2, 3)(3, 2)(3, 3)\}$$

$$B^2 = \{2, 3\} \times \{2, 3\} \rightarrow \{(2, 2)(2, 3)(3, 2)(3, 3)\}$$

$$A \times B - B^2 = \{(1, 2)(1, 3)\}$$

$$f(x) = \begin{cases} x^2 - 1 : x \leq 1 \rightarrow x = 1 \rightarrow 0 \\ ax + b : 1 < x \leq 2 \rightarrow x = 1 \rightarrow a + b, x = 2 \rightarrow 2a + b \\ x^2 : x > 2 \rightarrow x = 2 \rightarrow 4 \end{cases}$$

$$\begin{cases} a + b = 0 \\ 2a + b = 4 \end{cases} \rightarrow \begin{cases} -a - b = 0 \\ 2a + b = 4 \end{cases}$$

$$a = 4, b = -4 \rightarrow a \times b = 4 \times -4 = -16$$

$$m + 2 = m^2 \rightarrow m^2 - m - 2 = 0$$

$$(m - 2)(m + 1)$$

$$m = 2 \quad \boxed{m = -1}$$

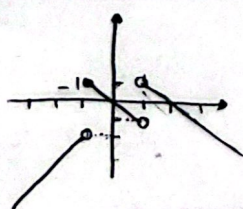
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$$m + 2 = m^2 \rightarrow m^2 - m - 2 = 0 \rightarrow \begin{cases} m = 2 \\ m = -1 \end{cases}$$

مقادیر صحیح و نادرست

$$f(x) = \begin{cases} x^2 - 3 : x \geq k \rightarrow x = k \rightarrow k^2 - 3 \\ 4 - 3x : x \leq k \rightarrow x = k \rightarrow 4 - 3k \end{cases} \Rightarrow k^2 - 3 = 4 - 3k$$

$$\Delta k = 7 \rightarrow \boxed{k = \frac{7}{2}}$$



$$D_f = \mathbb{R} - \{1\}$$

$$R_f = (-\infty, 1]$$

$$f(x) = \begin{cases} -x + 2 \rightarrow x > 1 \\ -x \rightarrow -1 \leq x < 1 \\ x - 1 \rightarrow x \leq -1 \end{cases}$$

الف) $2y^3 + x^2 + 1 = 0 \rightarrow 2y^3 = -x^2 - 1 \xrightarrow{x=0} 2y^3 = -1 \rightarrow y^3 = -\frac{1}{2} \rightarrow y = \sqrt[3]{-\frac{1}{2}}$

ب) $x^2 + 4y^2 - 2x - 12y + 10 = 0$

$(x-1)^2 + (2y-3)^2 = 0$

$x=1 \quad 2y-3=0 \rightarrow 2y=3 \rightarrow y=\frac{3}{2}$ بایستی

الف) $x \sin y = y \sin x \xrightarrow{x=0} y = \text{هر مقدار باشد}$ بایستی

ب) $\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2 \xrightarrow{x=y} \sqrt{\frac{1}{1}} + \sqrt{\frac{1}{1}} = 2 \rightarrow y=1 \rightarrow \left| \right|$ بایستی
 $\frac{1}{y} \geq 0 \quad y \geq 0$

الف) $y = \sqrt{\frac{x-1}{x-3}} + \sqrt{\frac{x-2}{x}}$ x=1 $\frac{x-1}{x-3} \geq 0 \rightarrow \frac{1-1}{1-3} \geq 0 \rightarrow \frac{0}{-2} \geq 0 \rightarrow (-\infty, 1] \cup (3, +\infty) = D_f$
x=2 $\frac{x-2}{x} \geq 0 \rightarrow \frac{2-2}{2} \geq 0 \rightarrow \frac{0}{2} \geq 0 \rightarrow (0, 2] \cup [3, +\infty) = D_f$
 $D_f = (-\infty, 1] \cup (3, +\infty)$

الف) $\sqrt{x^2 - 5x + 6} \geq 0 \rightarrow x^2 - 5x + 6 \geq 0 \rightarrow (x-2)(x-3) \geq 0 \rightarrow \frac{1}{x-2} \geq 0 \rightarrow (-\infty, 2] \cup [3, +\infty)$
 $-5x + 6 \geq 0 \rightarrow 5x \leq 6 \rightarrow x \leq \frac{6}{5}$
 $D_f = (-\infty, 2] \cup [3, +\infty)$

ب) $\sqrt{\frac{x^2 - 5x + 6}{x^2 - 10x + 12}} \geq 0 \rightarrow \frac{x^2 - 5x + 6}{x^2 - 10x + 12} \geq 0 \rightarrow \frac{(x-2)(x-3)}{(x-5)(x-2)} \geq 0 \rightarrow \frac{1}{x-5} \geq 0 \rightarrow (-\infty, 5] \cup [7, +\infty)$
 $D_f = (-\infty, 5] \cup [7, +\infty)$

الف) $y = \frac{\sqrt{x^2 - 5x + 6}}{\sqrt{x^2 - 5x + 4}} \geq 0 \rightarrow \frac{x^2 - 5x + 6}{x^2 - 5x + 4} \geq 0 \rightarrow \frac{(x-2)(x-3)}{(x-1)(x-4)} \geq 0 \rightarrow \frac{1}{x-1} \geq 0 \rightarrow (-\infty, 1] \cup [4, +\infty)$
 $\frac{x^2 - 5x + 6}{x^2 - 5x + 4} \geq 0 \rightarrow \frac{(x-2)(x-3)}{(x-1)(x-4)} \geq 0 \rightarrow \frac{1}{x-1} \geq 0 \rightarrow (-\infty, 1] \cup [4, +\infty)$
 $D_f = (-\infty, 1] \cup [4, +\infty)$

ب) $y = \sqrt{\frac{x^2 - 5x + 6}{x^2 - 5x + 4}} \geq 0 \rightarrow \frac{x^2 - 5x + 6}{x^2 - 5x + 4} \geq 0 \rightarrow \frac{(x-2)(x-3)}{(x-1)(x-4)} \geq 0 \rightarrow \frac{1}{x-1} \geq 0 \rightarrow (-\infty, 1] \cup [4, +\infty)$
 $D_f = (-\infty, 1] \cup [4, +\infty)$

$\sqrt{x} + \sqrt{y-1} = \sqrt{3}$

$(-\infty, 1]$

$\leftarrow \text{ب} \quad \textcircled{A}$

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

$D_f = [0, +\infty)$