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

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

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

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$$m^2 = m + 2$$

$$m^2 - m - 2 = 0$$

$$(m+1)(m-2) = 0 \Rightarrow m = -1 \rightarrow \text{غلط} \quad m = 2 \rightarrow \text{درست}$$

الف) $m = -1$
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$$m^2 = m + 2$$

$$m^2 - m - 2 = 0$$

$$(m+1)(m-2) = 0 \Rightarrow m = -1 \rightarrow \text{غلط} \quad m = 2 \rightarrow \text{درست}$$

ب) به ازای هیچ مقدار n تابع نیست

$$x=1 \rightarrow x^2 - 1 = ax + b \Rightarrow (1)^2 - 1 = a + b = 0$$

$$x=2 \rightarrow ax + b = x^2 \Rightarrow (2)a + b = (2)^2 = 4$$

$$\begin{cases} a+b=0 \\ 2a+b=4 \end{cases} \Rightarrow \begin{cases} (2a+b) - (a+b) = a = 4 \\ 4+b=0 \Rightarrow b=-4 \end{cases}$$

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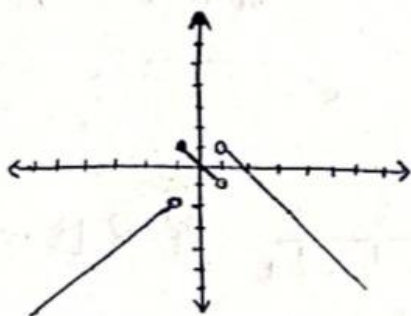
$$x=k \rightarrow x^2 - 1 = 4 - 2x$$

$$x^2 + 2x - 5 = 0$$

$$x = \frac{-2 \pm \sqrt{4 + 20}}{2}$$

$$x = \frac{-2 \pm \sqrt{24}}{2}$$

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

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

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$$2y^2 + x^2 + 1 = 0 \quad \left. \begin{matrix} (x_1, y_1) \in E_f \\ (x_2, y_2) \in E_f \\ x_1 = x_2 \\ y_1 = y_2 \end{matrix} \right\} y_1 = y_2$$

$$2y_1^2 + x_1^2 + 1 = 2y_2^2 + x_2^2 + 1 \\ 2y_1^2 = 2y_2^2 \Rightarrow y_1 = y_2$$

الف) تابع است

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$$x^2 + 4y^2 - 2x - 12y + 10 = 0$$

$$x^2 - 2x + 1 + 4y^2 - 12y + 9 = 0 \Rightarrow (x-1)^2 + (y-3)^2 = 0$$

تابع تک نقطه است $x=1, y=3$

ب) هست

$$x \sin y = y \sin x \quad x=0 \rightarrow y=R$$

الف) نیست

$$\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2 \xrightarrow{\text{دو طرفه توان ۲}} \frac{x}{y} + \frac{y}{x} + 2\sqrt{\frac{y}{x} \cdot \frac{x}{y}} = 2 \Rightarrow \frac{x}{y} + \frac{y}{x} = 0$$

$$\frac{x}{y} + \frac{y}{x} = 0 \xrightarrow{\text{دو طرفه ضرب در } xy} x^2 + y^2 = 2xy \quad x^2 + y^2 - 2xy = 0 \quad (x-y)^2 = 0 \Rightarrow x=y$$

ب) هست

$$y = \sqrt{\frac{x-1}{x-2}} + \sqrt{\frac{2-x}{x}} \quad \begin{matrix} \text{---} & \text{---} \\ | & | \\ 1 & 2 \end{matrix}$$

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

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

$$\sqrt{y-1} = \sqrt{3-x} \quad \begin{matrix} \sqrt{x} + \sqrt{3-x} \geq 0 \\ -\sqrt{x} \geq -\sqrt{3-x} \\ x \leq 3 \end{matrix}$$

$$[0, \infty) \cap (-\infty, 3] = [0, 3] = D_f$$

ب)

$$y = \frac{\sqrt{x^2 - 7x + 4}}{\sqrt{x^2 - 11x + 14}} = \frac{\sqrt{(x-1)(x-4)}}{\sqrt{(x-2)(x-7)}} \rightarrow \begin{matrix} \text{---} & \text{---} \\ | & | \\ 1 & 4 \end{matrix}$$

$$(1, 4) \cap (\mathbb{R} - [2, 7]) = (1, 2) \cup (4, 7) = D_f$$

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

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$$y = \sqrt{\frac{x^2 - 7x + 4}{x^2 - 11x + 14}} = \sqrt{\frac{(x-1)(x-4)}{(x-2)(x-7)}} \rightarrow \begin{matrix} \text{---} & \text{---} & \text{---} & \text{---} \\ | & | & | & | \\ 1 & 2 & 4 & 7 \end{matrix}$$

$$D_f = \mathbb{R} - ((1, 2] \cup (4, 7])$$

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$$y = \frac{\sqrt{2x^2 - 8x + 3}}{\sqrt{3x^2 - 7x + 4}} = \frac{\sqrt{(2x-3)(x-1)}}{\sqrt{(3x-4)(x-1)}} \rightarrow \begin{matrix} \text{---} & \text{---} & \text{---} \\ | & | & | \\ 1 & \frac{4}{3} & 1 \end{matrix}$$

$$D_f = \mathbb{R} - [1, \frac{4}{3}]$$

الف)

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$$y = \sqrt{\frac{2x^2 - 5x + 3}{3x^2 - 7x + 4}} = \sqrt{\frac{(2x-3)(x-1)}{(3x-4)(x-1)}} \rightarrow \begin{matrix} \text{---} & \text{---} & \text{---} & \text{---} \\ | & | & | & | \\ 1 & \frac{4}{3} & 1 & 1 \end{matrix}$$

$$D_f = \mathbb{R} - [\frac{4}{3}, 1]$$

ب)