

$$A \times B = \{(1,2), (1,3), (2,3), (2,4), (3,4), (3,5)\}$$

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

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

الف) $F(x) = \{(3, m^2), (2, 1), (-3, m), (3, m+2), (m, 3)\}$

$$m^2 = m+2$$

$$m^2 - m = 2 \rightarrow m(m-1) = 2 \rightarrow m \rightarrow \begin{cases} 2 \\ -1 \end{cases}$$

ب) $g(x) = \{(3, m^2), (2, 1), (m, 3), (3, m+2), (-2, m), (-1, 3)\}$

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

(به ازای هیچ مقدار x) کلاً تابع نیست

$$f(x) = \begin{cases} x^2 - 1 & x \leq 1 \\ ax + b & 1 \leq x \leq 2 \\ x^3 & x > 2 \end{cases}$$

$$a \times b = ?$$

$$a = 2 \begin{cases} 1a + b \\ 1 \end{cases}$$

$$-2b + b = 1$$

$$b = -1$$

$$a = 1$$

$$a \times b = -2$$

$$a = 1 \begin{cases} 1 - 1 = 0 \\ a(1) + b = a + b \end{cases} \Rightarrow a + b = 0 \rightarrow a = -b$$

$$F(x) = \begin{cases} 2x - 3 & x > k \\ 5 - 3x & x \leq k \end{cases}$$

$$\Rightarrow \text{استمرار این دو ک است} \Rightarrow k = -\frac{1}{5}$$

$$2x - 3 = 5 - 3x$$

$$5x = 8$$

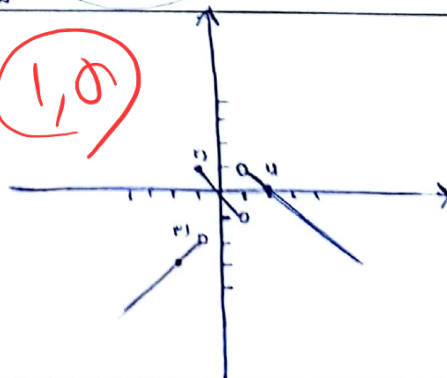
$$x = \frac{8}{5}$$

$$\Rightarrow \begin{cases} \frac{1}{5} > \frac{1}{5} \\ \frac{2}{5} > \frac{2}{5} \end{cases} \begin{cases} x > k \\ x \leq k \end{cases}$$

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

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

$$R_f = \mathbb{R} \cup (-\infty, 1]$$



$$\text{الف) } xy^3 + x^2 + 1 = 0 \Rightarrow \frac{xy^3}{y^3} = \frac{-x^2 - 1}{y^3} \Rightarrow y_1^3 = \frac{-x^2 - 1}{y^3} \Rightarrow y_1^3 = y_2^3 \Rightarrow y_1 = y_2$$

$$\text{ب) } x^2 + 4x^2 - 2x - 12y + 10 = 0 \Rightarrow (x-1)^2 + (y-2)^2 = 0 \Rightarrow (x-1)^2 = 0 \wedge (y-2)^2 = 0 \Rightarrow x=1, y=2$$

عبارت شامل نقطه
تابع نیست X تابع است
پس تابع است

$$\text{الف) } x \sinh y = y \sinh x$$

$$x=90 \Rightarrow 90 \times \sinh y = y \times \sinh 90 \Rightarrow 90 \times \sinh y = y \Rightarrow y=90$$

$$\text{ب) } \left(\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} \right)^2 = 2$$

$$\frac{x}{y} + \frac{y}{x} + 2 = 2 \Rightarrow \frac{x}{y} + \frac{y}{x} = 0 \Rightarrow \frac{x^2 + y^2}{xy} = 0 \Rightarrow x^2 + y^2 = 0 \Rightarrow x=0, y=0$$

$$\text{الف) } y = \sqrt{\frac{x-1}{x-3}} + \sqrt{\frac{y-1}{y-3}}$$

$$\frac{x-1}{x-3} \geq 0 \Rightarrow \frac{1}{1} - \frac{2}{3} +$$

$$\frac{y-1}{y-3} \geq 0 \Rightarrow \frac{1}{1} - \frac{2}{3} +$$

$$D_f = [0, 3]$$

حاصل نویسی

$$(-\infty, 1] \cup (3, +\infty) \cup [1, 3] = D_f$$

$$\text{الف) } \frac{\sqrt{x^2 - 7x + 6}}{\sqrt{x - 10x + 14}} = \frac{1}{1} \Rightarrow \frac{1}{1} - \frac{2}{1} +$$

$$x^2 - 7x + 6 \geq 0 \Rightarrow (x-6)(x-1) \geq 0$$

$$x - 10x + 14 \geq 0 \Rightarrow x \leq \frac{14}{9}$$

$$D_f = (-\infty, 1] \cup (3, +\infty)$$

$$\text{ب) } \frac{\sqrt{x^2 - 7x + 6}}{\sqrt{x - 10x + 14}} = \frac{1}{1} \Rightarrow \frac{1}{1} - \frac{2}{1} +$$

$$D_f = (-\infty, 1] \cup (3, 4] \cup (4, +\infty)$$

$$\text{الف) } \frac{\sqrt{2x^2 - 5x + 3}}{\sqrt{3x^2 - 7x + 4}} = \frac{1}{1} \Rightarrow \frac{1}{1} - \frac{2}{1} +$$

$$2x^2 - 5x + 3 \geq 0 \Rightarrow (x-1)(2x-3) \geq 0$$

$$3x^2 - 7x + 4 \geq 0 \Rightarrow (3x-4)(x-1) \geq 0$$

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

$$\text{ب) } \frac{\sqrt{2x^2 - 5x + 3}}{\sqrt{3x^2 - 7x + 4}} = \frac{1}{1} \Rightarrow \frac{1}{1} - \frac{2}{1} +$$

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