

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

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

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

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الف) $m^2 \leq m+2 \rightarrow m^2 - m - 2 \leq 0 \rightarrow (m-2)(m+1) \leq 0 \rightarrow m \in [-1, 2]$
 $m \leq 2 \rightarrow (2,4), (2,1) \Rightarrow \text{غ} \text{ ق} \text{ ق}$
 $2 \leq 2, 1 \neq 4$

ب) $m^2 \leq m+2 \rightarrow m^2 - m - 2 \leq 0 \rightarrow (m-2)(m+1) \leq 0 \rightarrow m \in [-1, 2]$
 $m \leq -1 \rightarrow (-1,4), (-1,3) \Rightarrow \text{غ} \text{ ق} \text{ ق}$
 $-1 \leq -1, 4 \neq 3$
 $(2,1), (2,4) \Rightarrow \text{غ} \text{ ق} \text{ ق}$
 $2 \leq 2, 1 \neq 4$
 (به ازای هیچ مقدار صحیحی) تابع نیست

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$$\begin{aligned} x \leq 2 &\rightarrow 2a+b \leq 1 \\ x < 1 &\rightarrow \frac{1}{0} \leq a+b \end{aligned} \quad \left\{ \begin{aligned} a+b \leq 0 &\rightarrow a \leq -b \\ a+b \leq 1 &\rightarrow -b+b \leq 1 \rightarrow b \leq 1, a \leq 1 \end{aligned} \right.$$

$$a \times b \leq 1 \times (-1) \leq -1$$

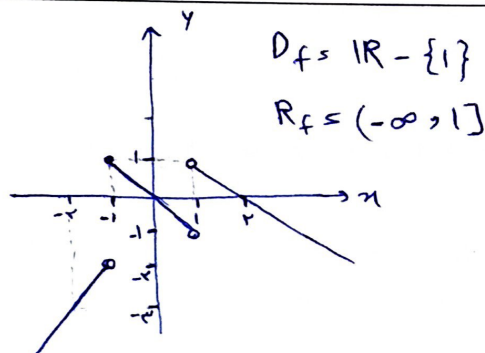
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$$x \leq k \rightarrow 2k-3 \leq 4-3k \leq 0 \leq k \leq v \rightarrow k \leq \frac{v}{5}$$

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

$$\rightarrow \begin{array}{c|c|c} x & y & \\ \hline 1 & 1 & 0 \\ \hline \end{array} \quad \begin{array}{c|c|c} x & y & \\ \hline -1 & -1 & 1 \\ \hline \end{array} \quad \begin{array}{c|c|c} x & y & \\ \hline -2 & -3 & -1 \\ \hline \end{array}$$



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الف) $2y^2 + x^2 + 150 \rightarrow 2y_1^2 + x_1^2 + 150 \Rightarrow 2y_1^2 + 150 = 2y_2^2 + 150$
 $2y_1^2 + x_1^2 + 150 \Rightarrow 2y_2^2 + x_2^2 + 150$
 $x_1^2 = x_2^2 \Rightarrow x_1 = x_2$
 $y_1 = y_2$ تابع است.

ب) $x^2 + 2y^2 - 2x - 12y + 150 = 0$
 $\frac{x^2 - 2x}{1} + \frac{2y^2 - 12y}{1} + 150 = 0$

$x^2 + 1 - 2x + 2y^2 - 12y + 9 = 0 \Rightarrow (x-1)^2 + (y-3)^2 = 0$
 $(x-1)^2 = 0 \Rightarrow x=1$
 $(y-3)^2 = 0 \Rightarrow y=3$
 $(1, 3) \rightarrow$ تابع است.

الف) $x \sin y \leq y \sin x \Rightarrow x \leq 0 \rightarrow y \sin(0) \leq 0 \rightarrow y \leq 1 \in \mathbb{R}$
 شال نقض

ب) $\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} \leq 2 \xrightarrow{(\cdot)^2} 2 + \frac{x}{y} + \frac{y}{x} \leq 4 \Rightarrow \frac{x^2 + y^2}{xy} \leq 2 \rightarrow x^2 + y^2 \leq 2xy$
 $x^2 + y^2 - 2xy \leq 0 \Rightarrow (x-y)^2 \leq 0$
 $x-y=0 \Rightarrow x=y \rightarrow$ تابع است.

الف) $y \leq \sqrt{\frac{x-1}{x-2}} + \sqrt{\frac{2-x}{x}} \quad \textcircled{1} \frac{x-1}{x-2} \geq 0 \Rightarrow x \leq 1$
 $\textcircled{2} \frac{2-x}{x} \geq 0 \Rightarrow x \leq 2$
 $\textcircled{1} \cap \textcircled{2} \Rightarrow Df \subseteq (0, 1]$

ب) $\sqrt{x+1} + \sqrt{y-1} \leq \sqrt{2} \quad \textcircled{1} x \geq 0 \quad \textcircled{2} y \geq 0$
 $\textcircled{1} \cap \textcircled{2} \Rightarrow Df \subseteq [0, 2]$

الف) $y \leq \frac{\sqrt{x^2 - 7x + 6}}{\sqrt{x - 10x + 14}} \quad \textcircled{1} x^2 - 7x + 6 \geq 0 \Rightarrow x \leq 6, x \geq 1$
 $\textcircled{2} x^2 - 10x + 14 > 0$
 $Df \subseteq \textcircled{1} \cap \textcircled{2} \subseteq (-\infty, 1] \cup (6, +\infty)$

$Df \subseteq \textcircled{1} \cap \textcircled{2} \subseteq (-\infty, 1] \cup (6, +\infty)$
 $(x-1)(x-6) \leq 0 \Rightarrow x \leq 1 \vee x \geq 6$
 $\frac{x^2 - 7x + 6}{x^2 - 10x + 14} \geq 0 \Rightarrow \frac{(x-1)(x-6)}{(x-2)(x-7)} \geq 0$
 $Df \subseteq (-\infty, 1] \cup (6, +\infty)$

الف) $\textcircled{1} 2x - 5x + 3 \geq 0 \rightarrow x \leq 1 \quad x \leq \frac{3}{3}$
 $\textcircled{2} 2x^2 - 7x + 4 \geq 0 \rightarrow x \leq 1 \quad x \leq \frac{4}{2}$

$\textcircled{1} \cap \textcircled{2} \subseteq Df \subseteq (-\infty, 1] \cup [\frac{3}{3}, +\infty)$
 $Df \subseteq (-\infty, 1] \cup (\frac{3}{3}, +\infty)$

ب) $\frac{2x^2 - 5x + 3}{2x^2 - 7x + 4} \geq 0 \rightarrow x \leq 1 \quad x \leq \frac{3}{3}$
 $\rightarrow x \leq 1 \quad x \leq \frac{4}{2}$

$Df = (-\infty, 1] \cup (1, \frac{4}{2}) \cup [\frac{3}{3}, +\infty)$