

$$A \times B - (B \times B) = ?$$

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

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

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

الف) $m^2 = m + 2 \rightarrow m^2 - m - 2 = 0$ $\begin{cases} m = -1 \\ m = 2 \end{cases}$
 $m = 2 \rightarrow (2,4), (2,1) \rightarrow$ غ ق ق

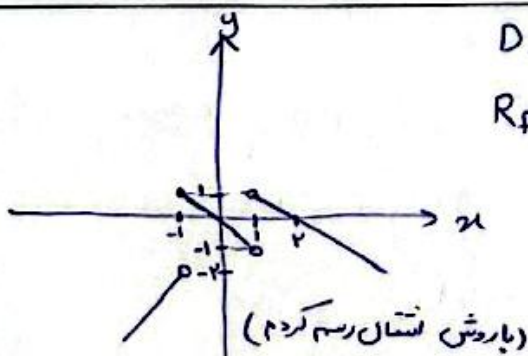
ب) $m^2 = m + 2 \rightarrow m^2 - m - 2 = 0$ $\begin{cases} m = -1 \rightarrow (-1,4), (-1,3) \rightarrow$ غ ق ق
 $m = 2 \rightarrow (2,4), (2,1) \rightarrow$ غ ق ق

به ازای هیچ مقدار حقیقی m تابع نیست!

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

$\begin{cases} a + b = 0 \\ 2a + b = 1 \end{cases} \rightarrow \begin{cases} a + b = 0 \rightarrow 1 + b = 0 \rightarrow b = -1 \\ 2a + b = 1 \end{cases}$
 $a = 1$
 $a \times b = 1 \times (-1) = -1$

$x = k \rightarrow 2k - 3 = 4 - 3k \rightarrow 5k = 7 \rightarrow k = \frac{7}{5}$



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

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

الف) $2y^3 + x^2 + 1 = 0$ $2y_1^3 + x_1^2 + 1 = 0$ $2y_2^3 + x_2^2 + 1 = 0$ $\left\{ \begin{array}{l} x_1 = x_2 \\ 2y_1^3 + 1 = 2y_2^3 + 1 \rightarrow 2y_1^3 = 2y_2^3 \rightarrow y_1^3 = y_2^3 \rightarrow y_1 = y_2 \end{array} \right.$ تابع است ✓ ب) $x^2 + 4y^2 - 2x - 12y + 1 = 0 \rightarrow x^2 - 2x + 1 + 4y^2 - 12y + 9 = 0 \rightarrow (x-1)^2 + (2y-3)^2 = 0$ جمع عبارت مثبت برابر صفاست پس هر دو برابر صفر هستند $\left\{ \begin{array}{l} x-1=0 \rightarrow x=1 \\ 2y-3=0 \rightarrow y=\frac{3}{2} \end{array} \right.$ تابع است ✓	۶
الف) $x \sin y = y \sin x$ $x=0 \rightarrow y \sin(0) = 0 \rightarrow y \in \mathbb{R}$ تابع نیست X ب) $\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2$ $\frac{x^2+y^2}{xy} = 2 \rightarrow x^2+y^2 = 2xy \rightarrow x^2+y^2-2xy=0 \rightarrow (x-y)^2=0 \rightarrow x=y$ پس تابع است ✓ $(\sqrt{\frac{x}{y}})^2 + (\sqrt{\frac{y}{x}})^2 + 2\sqrt{\frac{xy}{yx}}$ $\rightarrow \frac{x}{y} + \frac{y}{x} + 2$	۷
الف) $\sqrt{\frac{x-1}{x-3}} + \sqrt{\frac{2-x}{x}} \geq 0$ $\frac{x-1}{x-3} \geq 0$ $\frac{2-x}{x} \geq 0$ $\frac{x-1}{x-3} \geq 0 \rightarrow (-\infty, 3] \cup (1, +\infty)$ ① $\frac{2-x}{x} \geq 0 \rightarrow (0, 2]$ ② $① \cap ② \rightarrow D_f = (0, 1]$ ب) $\sqrt{x} + \sqrt{y-1} = \sqrt{3}$ $\sqrt{y-1} = \sqrt{3-x}$ $\sqrt{3-x} \geq 0 \rightarrow x \leq 3$ $\sqrt{3-x} \geq 0 \rightarrow 3-x \geq 0 \rightarrow x \leq 3$ ① $\sqrt{3-x} \geq 0 \rightarrow 3-x \geq 0 \rightarrow x \leq 3$ ② $① \cap ② \rightarrow D_f = (-\infty, 3]$	۸
الف) $y = \sqrt{x^2 - 7x + 4}$ $x^2 - 7x + 4 \geq 0$ $x_1=1$ $x_2=4$ $x^2 - 1x + 14 > 0$ $x_1=2$ $x_2=1$ $x^2 - 7x + 4 \geq 0 \rightarrow (-\infty, 1] \cup [4, +\infty)$ ① $x^2 - 1x + 14 > 0 \rightarrow (-\infty, 2) \cup (1, +\infty)$ ② $D_f = ① \cap ② = (-\infty, 1] \cup (1, +\infty)$ ب) $\sqrt{\frac{x^2-7x+4}{x^2-1x+14}} \geq 0$ $\frac{x^2-7x+4}{x^2-1x+14} \geq 0$ $x_1=1$ $x_2=4$ $x_1=2$ $x_2=1$ $D_f = (-\infty, 1] \cup (2, 4] \cup (1, +\infty)$	۹
الف) $\sqrt{2x^2-5x+3} \geq 0$ $2x^2-5x+3 \geq 0$ $x_1=1$ $x_2=\frac{3}{2}$ $3x^2-7x+4 > 0$ $x_1=1$ $x_2=\frac{4}{3}$ $D_f = (-\infty, 1) \cup (1, \frac{3}{2}) \cup [\frac{4}{3}, +\infty)$ ب) $\sqrt{\frac{2x^2-5x+3}{3x^2-7x+4}} \geq 0$ $\frac{2x^2-5x+3}{3x^2-7x+4} \geq 0$ $x_1=1$ $x_2=\frac{3}{2}$ $x_1=1$ $x_2=\frac{4}{3}$ $D_f = (-\infty, 1) \cup (1, \frac{3}{2}) \cup [\frac{4}{3}, +\infty)$	۱۰