

$$A = \{1, 2, 3\} \quad B = \{2, 3\} \quad A \times B = B^2$$

$$A \times B = \{[1, 2], [1, 3], [2, 2], [2, 3], [3, 2], [3, 3]\}$$

$$B^2 = \{[2, 2], [2, 3], [3, 3], [3, 2]\} \quad A \times B - B^2 = \{[1, 2], [1, 3]\}$$

الف) $m^2 = m + 2 \quad m^2 - m - 2 = 0 \quad (m - 2)(m + 1) \rightarrow m = 2$

$\xrightarrow{m=2} (3, 4), (2, 1), (-3, 2), (-2, 2), (3, 4), (2, 4) \times$

$\xrightarrow{m=-1} (3, 1), (2, 1), (-3, -1), (-2, -1), (3, 1), (-1, 4) \checkmark \rightarrow m = -1$

ب) $m^2 = m + 2 \quad (m - 2)(m + 1) \xrightarrow{m=2} (3, 4), (2, 1), (2, 4), (3, 4), (-2, 2), (-2, 3) \times$

$\xrightarrow{m=-1} (3, 1), (2, 1), (1, 4), (3, 1), (-2, -1), (-1, 3) \times$ در هیچ صورت تابع نیست

$$f(x) = \begin{cases} x^2 - 1 & x \leq 1 \rightarrow x = 1 \quad 1^2 - 1 = 0 \quad ax + b \Rightarrow a + b = 0 \quad b = -a \\ ax + b & 1 \leq x \leq 2 \\ x^3 & x \geq 2 \rightarrow x = 2 \quad 2^3 = 8 \quad ax + b \Rightarrow 2a + b = 8 \end{cases}$$

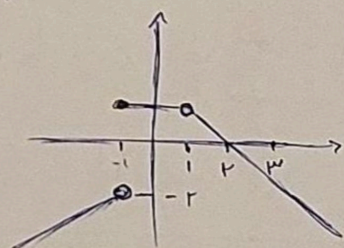
$$\begin{cases} b = -a \\ 2a + b = 8 \end{cases} \rightarrow 2a - a = 8 \quad a = 8 \quad a \times b = 8 \times -8 = -64 \quad b = -8$$

$$f(x) = \begin{cases} 2x - 3 & x \geq k \\ f - 3x & x \leq k \end{cases}$$

$$\xrightarrow{k=x} 2k - 3 = f - 3k \quad \omega k = 5 \quad \boxed{k = \frac{5}{5}}$$

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

$$D_f = R - [1]$$



الف) $2y_1^3 + x_1^2 + 1 = 0 \rightarrow 2y_1^3 = -x_1^2 - 1$ $2y_1^3 = 2y_2^3$ $y_1^3 = y_2^3$ $y_1 = y_2$
 $2y_2^3 = -x_2^2 - 1$ تابع است

$$\begin{aligned} \text{ب) } x^2 + y^2 - 2x - 12y + 10 &= 0 \rightarrow y^2 - 12y + (x^2 - 2x + 10) = 0 \\ y_1^2 - 12y_1 &= -(x^2 - 2x + 10) \quad \left\{ \begin{array}{l} y_1^2 - 12y_1 = y_2^2 - 12y_2 \\ y_1^2 - 12y_1 = -(x^2 - 2x + 10) \end{array} \right. \end{aligned}$$

تابع سين $\alpha = \pi, y = (\pi k, \dots)$ $\alpha \sin y = y \sin \alpha$ (الن)

$$c) \sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 1$$

$$\sqrt{\frac{x}{y}} = t \rightarrow t + \frac{1}{t} = 2 \quad t^2 - 2t + 1 = 0 \quad (t-1)^2 = 0 \quad t = 1$$

تابع است $x=y$ $\frac{x}{y}=1$ $\sqrt{\frac{x}{y}}=1$

$$\text{الف) } y = \sqrt{\frac{x-1}{x-3}} + \sqrt{\frac{2-x}{x}} \rightarrow \begin{cases} \frac{x-1}{x-3} \geq 0 & \frac{1}{x-3} \geq 0 \quad (-\infty, 1] \cup (3, +\infty) \text{ ①} \\ \frac{2-x}{x} \geq 0 & \frac{2}{x} \geq 0 \quad (0, 2] \text{ ②} \end{cases}$$

$$\textcircled{1} \cap \textcircled{2} \rightarrow (0, 1]$$

$$\text{ب) } \sqrt{x} + \sqrt{y-1} = \sqrt{3} \quad x \geq 0 \quad \sqrt{x} \leq \sqrt{3} \quad x \leq 3 \rightarrow D_f = [0, 3]$$

$$\text{الف) } \left. \begin{array}{l} \sqrt{x^2 - 4} \geq 0 \quad (x-2)(x+2) \geq 0 \quad \frac{+}{+} \frac{-}{-} \frac{+}{+} \\ \sqrt{x^2 - 10x + 14} > 0 \quad (x-1)(x-14) > 0 \quad \frac{+}{+} \frac{-}{-} \frac{+}{+} \end{array} \right\} \cap (-\infty, 1] \cup (14, +\infty)$$

5) $\frac{\sqrt{x^2 - 10x + 14}}{x^2 - 10x + 14} \geq 0$

1	2	3	4
+	0	-	+
	1	2	3

$(-\infty, 1] \cup (2, 4] \cup (11, +\infty)$

ا) $\frac{\sqrt{r\alpha^r - \alpha\alpha + r}}{\sqrt{r\alpha^r - \alpha\alpha + r}} > 0 \rightarrow \alpha = 1 \quad \alpha = \frac{c}{a} = \frac{3}{2}$  $\rightarrow (-\infty, 1) \cup (\frac{3}{2}, +\infty)$
 ب) $\frac{\sqrt{r\alpha^r - \alpha\alpha + r}}{\sqrt{r\alpha^r - \alpha\alpha + r}} > 0 \rightarrow \alpha = 1 \quad \alpha = \frac{c}{a} = \frac{4}{3}$  $\rightarrow (-\infty, 1) \cup (\frac{4}{3}, +\infty)$

$$\therefore) \sqrt{\frac{rx^2 - 2x + w}{rx^2 - vx + f}} \geq 0 \rightarrow \frac{1^+ \quad r \quad w}{+ \quad - \quad +} \quad \frac{r}{v} \quad \frac{w}{f}$$

$$(-\infty, 1) \cup (1, \frac{\kappa}{\mu}) \cup (\frac{\kappa}{\gamma}, +\infty)$$