

$$A = \{1, 2, 3\}, B = \{2, 3\} \xrightarrow[\text{مکان}]{\text{ظنیت}} A \times B = B^2 \quad (1)$$

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

$$\Rightarrow A \times B - B^2 = \{(1, 2), (1, 3)\} \leftarrow \text{حاصل عبارت}$$

$$(الف) f(m) = \{(3, m^2), (2, 1), (-3, m), (-2, m), (3, m+2), (m, 4)\} \quad (2)$$

$$m^2 = m+2 \Rightarrow m^2 - m - 2 = 0 \Rightarrow m = \frac{1 \pm \sqrt{1+8}}{2} \Rightarrow m = -1$$

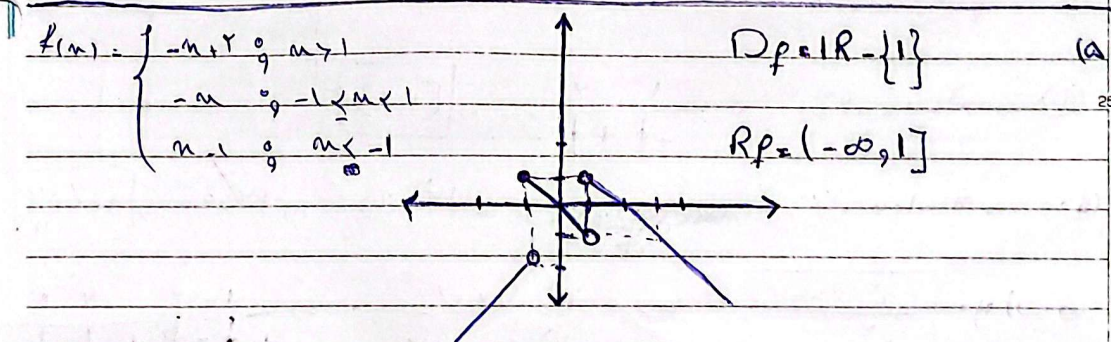
باقی به آن m برابر 2 و 3 است و آنجا ملاحظه شود و در شکل مشاهده

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

$$m^2 = m+2 \Rightarrow m^2 - m - 2 = 0 \Rightarrow m = \frac{1 \pm \sqrt{1+8}}{2} \Rightarrow m = -1 \text{ و } m = 2$$

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

$$f(x) = \begin{cases} 2x - 3 & ; x > k \\ 4 - 3x & ; x \leq k \end{cases} \Rightarrow 2x - 3 = 4 - 3x \Rightarrow 5x = 7 \Rightarrow x = \frac{7}{5} = k \quad (4)$$



$$(الف) 2y^3 + x^2 + 1 = 0 \Rightarrow 2y^3 = -x^2 - 1 \Rightarrow y^3 = \frac{-x^2 - 1}{2} \Rightarrow y = \sqrt[3]{\frac{-x^2 - 1}{2}} \quad (5)$$

$$\begin{cases} y_1^3 = \frac{-x^2}{2} - \frac{1}{2} \\ y_2^3 = \frac{-x^2}{2} - \frac{1}{2} \end{cases} \Rightarrow y_1^3 = y_2^3 \Rightarrow y_1 = y_2 \rightarrow \text{معادلات تابع نیست}$$

$$(ب) x^2 + 4y^2 - 2x - 12y + 10 = 0 \Rightarrow 4y^2 - 12y = -x^2 + 2x - 10$$

$$\xrightarrow{\text{امتحان 14}} x = 1 \Rightarrow 4y^2 - 12y = -1 + 2 - 10 = -9 \Rightarrow 4y^2 - 12y + 9 = 0$$

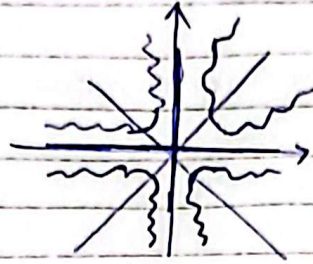
$$\Rightarrow y_1 = y_2 = \frac{3}{2} \leftarrow \text{معادلات تابع نیست، زیرا شیبان نمی باشد}$$

امتحان ریاضیات پایه دهم
 (الف) $x \sin y = y \sin x$ $\Rightarrow x=0 \Rightarrow y=0$ $\Rightarrow y=x$ $\Rightarrow$ عبارت تابع است

(ب) $\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2$

$x=1 \rightarrow \sqrt{\frac{1}{y}} + \sqrt{y} = 2$

$\Rightarrow \sqrt{y}=1$ $\leftarrow$ عبارت تابع هست



(الف) $y = \sqrt{\frac{x-1}{x-2}} + \sqrt{\frac{x-2}{x-1}}$

$\frac{x-1}{x-2} \geq 0 \Rightarrow \frac{1}{x-2} \geq 0 \Rightarrow x > 2$ $\Rightarrow D_f = (2, +\infty)$ $\Rightarrow D_f = \{1\}$ $\leftarrow$ (I) $\cap$ (II)

(ب) $\sqrt{x} + \sqrt{y-1} = \sqrt{3}$ $x \geq 0$ $y-1 \geq 0 \Rightarrow y \geq 1$

$\Rightarrow D_f = [0, +\infty)$

(الف) $y = \frac{\sqrt{x^2 - 5x + 4}}{\sqrt{x^2 - 10x + 14}}$

$D_f = [1, \frac{14}{9}]$

(I) $\rightarrow x^2 - 5x + 4 \geq 0 \Rightarrow \frac{1}{x-4} + \frac{1}{x-1} \geq 0 \Rightarrow [1, 4]$

(II) $\rightarrow x^2 - 10x + 14 \geq 0 \Rightarrow 14 - 10x \geq 0 \Rightarrow 14 \geq 10x \Rightarrow x \leq \frac{14}{10} = \frac{7}{5}$

(ب) $y = \frac{\sqrt{x^2 - 5x + 4}}{\sqrt{x^2 - 10x + 14}} \Rightarrow \frac{x^2 - 5x + 4}{x^2 - 10x + 14} \geq 0 \Rightarrow \frac{1}{x-4} + \frac{1}{x-1} \geq 0$

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

(الف) $y = \frac{\sqrt{2x^2 - 5x + 3}}{\sqrt{3x^2 - 7x + 4}} \Rightarrow \begin{cases} 2x^2 - 5x + 3 \geq 0 \Rightarrow \frac{1}{x-1} + \frac{1}{x-3} \geq 0 \Rightarrow (-\infty, 1] \cup (3, +\infty) \\ 3x^2 - 7x + 4 \geq 0 \Rightarrow \frac{1}{x-1} + \frac{1}{x-4} \geq 0 \Rightarrow (-\infty, 1) \cup (\frac{4}{3}, +\infty) \end{cases}$

(ب) $y = \frac{\sqrt{2x^2 - 5x + 3}}{\sqrt{3x^2 - 7x + 4}} \Rightarrow \frac{2x^2 - 5x + 3}{3x^2 - 7x + 4} \geq 0 \Rightarrow D_f = (-\infty, 1) \cup [\frac{4}{3}, +\infty)$

$\Rightarrow \frac{1}{x-1} + \frac{1}{x-4} \geq 0 \Rightarrow D_f = (-\infty, 1) \cup [\frac{4}{3}, +\infty)$