

$$AB - B^r \rightarrow B(A - B)$$

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$$A - B = \{1, 2, 3\} - \{2, 3\} \rightarrow \{1\}$$

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$$\{1\} \times \{2, 3\} \rightarrow \{(1, 2) \text{ و } (1, 3)\}$$

$$f(n) = \{(3, m^2), (2, 1), (-3, m), (-2, m), (3, m+2) \text{ و } (m, 4)\}$$

$$m^2 = m+2 \rightarrow m^2 - m - 2 = 0 \rightarrow m = 2 \text{ یا } m = -1$$

$$\Rightarrow m = -1$$

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

$$m^2 = m+2 \rightarrow m^2 - m - 2 = 0 \rightarrow m = 2 \text{ یا } m = -1$$

$\Rightarrow m = 2$ به ازای هیچ مقدار m تابع معنی ندارد

$$f(n) = \begin{cases} n^2 - 1 & n \leq 1 \\ an + b & 1 \leq n \leq 2 \\ n^3 & n \geq 2 \end{cases}$$

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$$n = 1 \rightarrow n^2 - 1 = an + b \rightarrow a + b = 0 \rightarrow a = -b$$

$$n = 2 \rightarrow n^3 = an + b \rightarrow 8 = 2a + b \rightarrow a = 4, b = 0$$

$$a \times b = 4 \times 0 = 0$$

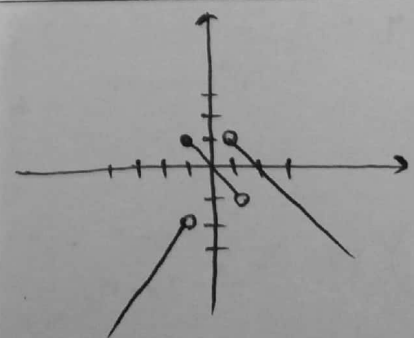
$$f(n) = \begin{cases} 2n - 3 & n \geq k \\ k - 3n & n \leq k \end{cases}$$

$$n = k \rightarrow 2k - 3 = k - 3k \rightarrow k = 3 \Rightarrow k = \frac{3}{2} = 1.5$$

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

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

$$R_f = (-\infty, -2) \cup (-1, 1]$$

$$\text{الف) } 2y^3 + x^2 + 1 = 0 \rightarrow \begin{cases} x_1 = x \rightarrow 2y_1^3 = -x_1^2 + 1 \\ m_1 = x \rightarrow 2y_1^3 = -x_1^2 + 1 \end{cases} \rightarrow 2y_1^3 = 2y_2^3 \Rightarrow y_1^3 = y_2^3$$

$$\rightarrow y_1 = y_2 \quad \checkmark \quad \text{تابع مستقیم} \quad (5)$$

$$\text{ب) } x^2 + 4y^2 - 2x - 12y + 10 = 0 \rightarrow (x-1)^2 + (2y-3)^2 = 0 \rightarrow \begin{cases} x-1=0 \\ 2y-3=0 \end{cases} \rightarrow \begin{cases} x=1 \\ y=1.5 \end{cases}$$

$$\checkmark \quad \text{تابع مستقیم} \quad (5)$$

$$\text{الف) } x \sin y = y \sin x \xrightarrow{x=0} y=0 \quad \text{یا} \quad y=180^\circ \quad \text{یا} \quad x=180^\circ \quad \text{یا} \quad x=y$$

$$x \sin y = y \sin x$$

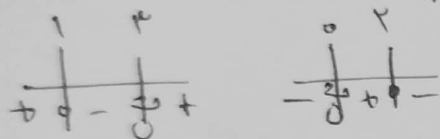
$$\checkmark \quad \text{تابع مستقیم} \quad (5)$$

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

$$a = \frac{1}{a} \geq 2 \quad \left| \quad \frac{x}{y} + \frac{y}{x} + 2\sqrt{\frac{xy}{yx}} \geq 2 \rightarrow \frac{x}{y} + \frac{y}{x} = 2 \rightarrow x^2 + y^2 = 2xy \rightarrow (x-y)^2 = 0 \rightarrow x=y$$

$$\checkmark \quad \text{تابع مستقیم} \quad (5)$$

$$\text{الف) } y = \sqrt{\frac{x-1}{x-4}} + \sqrt{\frac{x-4}{x-1}}$$

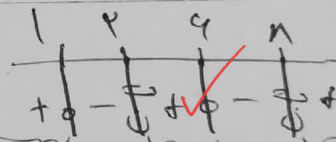


$$\Rightarrow D = (0, 1] \quad \checkmark \quad (5)$$

$$\rightarrow \sqrt{x} + \sqrt{y-1} = \sqrt{4}$$

$$\sqrt{x} \rightarrow x \geq 0 \rightarrow D = [0, 4] \quad \checkmark \quad \sqrt{y-1} = \sqrt{4} - \sqrt{x} \rightarrow \sqrt{4} - \sqrt{x} \geq 0 \rightarrow \sqrt{4} \geq \sqrt{x}$$

$$\text{ب) } y = \sqrt{\frac{x^2 - 5x + 4}{x^2 - 6x + 8}} \rightarrow \begin{cases} (x-4)(x-1) \geq 0 \rightarrow x \leq 1 \text{ or } x \geq 4 \\ (x-2)(x-4) \geq 0 \rightarrow x \leq 2 \text{ or } x \geq 4 \end{cases}$$



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

$$\text{الف) } \sqrt{x^2 - 5x + 4} \rightarrow \begin{cases} x \geq 4 \\ x \leq 1 \end{cases} \quad (I)$$

$$\sqrt{x^2 - 6x + 8} \rightarrow \begin{cases} x \geq 2 \\ x \leq 4 \end{cases} \quad (II)$$

$$I \cap II = (-\infty, 1] \cup (4, +\infty)$$

$$x \leq 1$$

$$\text{الف) } y = \sqrt{\frac{x^2 - 5x + 4}{x^2 - 6x + 8}} \rightarrow \begin{cases} x \geq 1 \\ x \geq \frac{4}{x} \end{cases} \quad (I)$$

$$\rightarrow \begin{cases} x \geq 1 \\ x \geq \frac{4}{x} \end{cases} \quad (II)$$

$$(I) \cap (II) \Rightarrow (-\infty, 1] \cup [\frac{4}{x}, +\infty)$$

$$(5)$$

$$\rightarrow \sqrt{\frac{x^2 - 5x + 4}{x^2 - 6x + 8}} \rightarrow \begin{cases} x \geq 1 \\ x \geq \frac{4}{x} \end{cases}$$

$$(-\infty, \frac{4}{x}) \cup [\frac{4}{x}, +\infty) = \mathbb{R}$$