

① تکلیف

* کیاں جعفری *

نہ نام خطا

۱) $A \times B = \{(3, 2), (3, 3), (2, 2), (2, 3), (1, 2), (1, 3)\}$ (۲)

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

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

۲) الف) $f(n) = \{(3, m^2), (2, 1), (-3, m), (2, m+2), (m, 2)\}$ (۲)

$m^2 = m+2 \Rightarrow m^2 - m - 2 = 0 \Rightarrow (m-2)(m+1) \Rightarrow m < 2$ غلط ✓

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

$m^2 = m+2 \Rightarrow m^2 - m - 2 = 0 \Rightarrow m < 2$ غلط ✓
 ب معنی صحیح مقدار
 m تابع می شود.

۳) $f(n) = \begin{cases} n^2 - 1 & ; n \leq 1 \\ an + b & ; 1 < n \leq 2 \\ n^3 & ; n \geq 2 \end{cases}$ (۲)

$\Rightarrow \begin{cases} 1^0 = a + b \Rightarrow a = -b \\ 1 = 2a + b \\ 1 = -b \Rightarrow -1 = b \\ a = 1 \end{cases}$ ✓

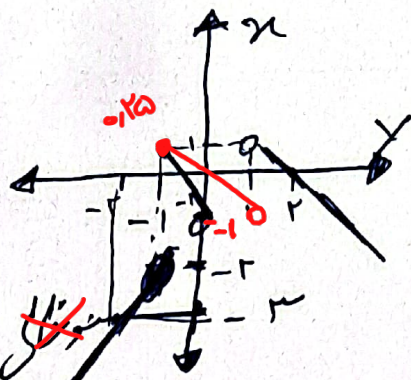
$\Rightarrow a \cdot b = -1 \times 1 = -1$ ✓

۴) $f(n) = \begin{cases} 2n - 3 & ; n \geq k \\ 4 - 3n & ; n \leq k \end{cases}$ (۲)

$\Rightarrow 2k - 3 = 4 - 3k$ ✓

Q $5k = 7 \Rightarrow k = \frac{7}{5}$ ✓

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



(1, 0)

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

$R_f = (-\infty, -1] \cup [-1, 1) \cup (1, +\infty)$ $R = (-\infty, 1]$

ه)

الف) $x^2 + y^2 + 1 = 0$

$\Rightarrow \begin{cases} (x, y) \in F(x) \\ (x, y_r) \in F(x) \end{cases} \Rightarrow y_1 = y_r$

$\Rightarrow \begin{cases} x^2 + y_1^2 + 1 = 0 \\ x^2 + y_r^2 + 1 = 0 \end{cases} \Rightarrow \boxed{y_1 = y_r}$

ب) $x^2 + y^2 - 2x - 12y + 10 = 0$

$(x^2 - 2x + 1) + (y^2 - 12y + 9) = 0 \Rightarrow (x-1)^2 + (y-3)^2 = 0$

$\Rightarrow x=1, y=3$

و)

الف) $x \sin y = y \sin x \quad x=0 \Rightarrow 0 = y \cdot 0$

✓ $\Rightarrow x=0$ مقبول نیست.

(2)

ب) $\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2 \Rightarrow \frac{x}{y} + \frac{y}{x} + 1 = 2$

$x^2 + y^2 = 2xy \Rightarrow x^2 - 2xy + y^2 = 0 \Rightarrow (x-y)^2 = 0$

$\Rightarrow \boxed{x=y}$ ✓

ز)

الف) $x = \sqrt{\frac{x-1}{x-2}} + \sqrt{\frac{2-x}{x}} \Rightarrow D_y = [0, 1] \cup [2, +\infty)$

$$1) \sqrt{x} - \sqrt{x-1} \geq 0 \rightarrow x \leq 1 \rightarrow D = [0, 1] \quad (1)$$

$$b) \sqrt{x} + \sqrt{y-1} = \sqrt{x} \quad x \geq 0 \Rightarrow D_y = [0, +\infty)$$

9)

$$a) \frac{\sqrt{x^2 - 2x + 1}}{\sqrt{x^2 - 10x + 17}} = \frac{\sqrt{(x-1)(x-1)}}{\sqrt{-9x+17}} \Rightarrow \frac{1}{+} \frac{1}{-} \frac{1}{+} \frac{1}{+}$$

$$\Rightarrow D_f = [1, +\infty) \cup \{1\} \quad \Rightarrow -9x+17 \geq 0 \Rightarrow x \leq \frac{17}{9} \quad D = (-\infty, 1] \quad (1, \infty)$$

$$b) \sqrt{\frac{x^2 - 2x + 1}{x^2 - 10x + 17}} \Rightarrow \frac{1}{+} \frac{1}{-} \frac{1}{+} \frac{1}{+}$$

$\checkmark \Rightarrow D_f = (-\infty, 1] \cup (1, 2] \cup (1, +\infty)$

$$10) y = \frac{\sqrt{x^2 - 2x + 1}}{\sqrt{x^2 - 2x + 1}} \Rightarrow \frac{1}{+} \frac{1}{-} \frac{1}{+} \frac{1}{+}$$

$\Rightarrow D_f = (-\infty, 1] \cup [1, +\infty) \quad \checkmark$

$$11) y = \sqrt{\frac{x^2 - 2x + 1}{x^2 - 2x + 1}} \Rightarrow \frac{1}{+} \frac{1}{-} \frac{1}{+} \frac{1}{+}$$

$\checkmark \quad D_y = (-\infty, \frac{1}{2}) \cup [1, +\infty) - \{1\}$

(2)