

شماره تکلیف: 1

کلاس: یازدهم دختر

آدرس خانوادگی: سائز فاخت

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

الف) $f(x) = \{(3, m^2), (2, 1), (-3, m), (-2, m), (3, m+2), (m, 4)\}$
 $m^2 = m+2 \rightarrow m^2 - m - 2 = 0 \rightarrow (m-2)(m+1) = 0 \rightarrow m = 2, -1 \rightarrow m = \{-1\}$

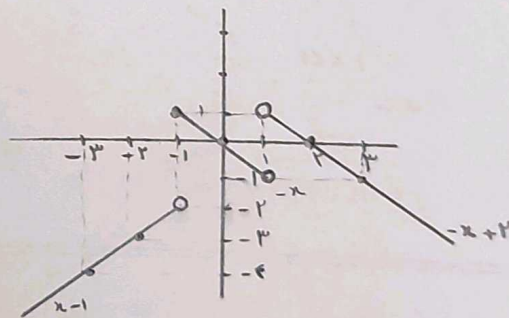
ب) $g(x) = \{(3, m^2), (2, 1), (m, 4), (3, m+2), (-2, m), (-1, 3)\}$
 $m^2 = m+2 \rightarrow m^2 - m - 2 = 0 \rightarrow (m-2)(m+1) = 0 \rightarrow m = -1, 2 \rightarrow m = \emptyset$

سوال 3) $f(x) = \begin{cases} x^2 - 1 & x \leq 1 \\ ax + b & 1 \leq x \leq 2 \\ x^3 & x \geq 2 \end{cases}$
 $\begin{cases} x=1 \rightarrow x^2 - 1 = ax + b \rightarrow 1 - 1 = a + b \rightarrow a + b = 0 \\ x=2 \rightarrow ax + b = x^3 \rightarrow 2a + b = 8 \end{cases}$
 $\begin{cases} a + b = 0 \\ 2a + b = 8 \end{cases} \rightarrow a = 8, b = -8$
 $a \times b = 8 \times (-8) = -64$

سوال 4) $f(x) = \begin{cases} 2x - 3 & x \geq K \\ 4 - 3x & x \leq K \end{cases}$
 $x=K \rightarrow 2K - 3 = 4 - 3K \rightarrow 2K - 3 = 4 - 3K \rightarrow 5K = 7 \rightarrow K = \frac{7}{5} = 1.4$

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

$D_f: \mathbb{R} - \{1\}$
 $R_f: (-\infty, +1]$



سوال 6) الف) $2y^3 + x^2 + 1 = 0 \rightarrow 2y^3 = -x^2 - 1$
 تابع است ✓

ب) $x^2 + 4y^2 - 2x - 12y + 10 = 0 \rightarrow x^2 - 2x + 1 + 4y^2 - 12y + 9 = 0 \rightarrow (x-1)^2 + (2y-3)^2 = 0$
 $\Rightarrow \begin{cases} x=1 \\ y=\frac{3}{2} \end{cases}$ تابع است ✓

سوال 7) الف) $x \sin y = y \sin x$ مثال بزن $x=90 \rightarrow 90 \sin y = y \sin 90 \rightarrow 90 \sin y = y \rightarrow y = \pm 90$

ب) $\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2 \rightarrow \frac{\sqrt{x}}{\sqrt{y}} + \frac{\sqrt{y}}{\sqrt{x}} = 2 \rightarrow \frac{x}{y} = 1 \rightarrow x = y$
 تابع است ✓

سوال ۸

$$g = \sqrt{\frac{x-1}{x-3}} + \sqrt{\frac{x-2}{x}} \rightarrow \frac{1}{1-\frac{3}{x}} + \frac{1}{1-\frac{2}{x}} \rightarrow (0, 2] \Rightarrow D: (-\infty, 1]$$

$$\frac{1}{1-\frac{3}{x}} \rightarrow (-\infty, 1] \cup (3, +\infty)$$

ب) $\sqrt{x} + \sqrt{x-1} = \sqrt{3} \rightarrow \sqrt{x-1} = \sqrt{3} - \sqrt{x} \rightarrow \sqrt{3} - \sqrt{x} > 0 \rightarrow \sqrt{x} \leq \sqrt{3} \rightarrow x \leq 3$
 $\Rightarrow D: [0, 3]$ $x > 0$

سوال ۹

الف) $g = \frac{\sqrt{x^2 - 7x + 4}}{\sqrt{x^2 - 10x + 4}} \rightarrow \frac{(x-1)(x-4)}{(x-2)(x-4)} \rightarrow \frac{1}{1-\frac{2}{x}} + \frac{1}{1-\frac{4}{x}} \Rightarrow D: (-\infty, 1]$
 $\sqrt{x^2 - 10x + 4} \rightarrow 14 - 9x > 0 \rightarrow \frac{14}{9} > x$

ب) $g = \frac{\sqrt{x^2 - 7x + 4}}{\sqrt{x^2 - 10x + 4}} \rightarrow \frac{(x-1)(x-4)}{(x-2)(x-4)} \rightarrow \frac{1}{1-\frac{2}{x}} + \frac{1}{1-\frac{4}{x}} \Rightarrow D: (+\infty, 1] \cup (2, 4] \cup (4, +\infty)$

سوال ۱۰

الف) $g = \frac{\sqrt{2x^2 - 5x + 3}}{\sqrt{3x^2 - 7x + 4}} \rightarrow \frac{(2x-3)(x-1)}{(3x-4)(x-1)} \rightarrow \frac{1}{1-\frac{4}{3x}} + \frac{1}{1-\frac{1}{x}} \Rightarrow D: (-\infty, 1) \cup [\frac{3}{2}, +\infty)$

ب) $g = \frac{\sqrt{2x^2 - 5x + 3}}{\sqrt{3x^2 - 7x + 4}} \rightarrow \frac{(2x-3)(x-1)}{(3x-4)(x-1)} \rightarrow \frac{1}{1-\frac{4}{3x}} + \frac{1}{1-\frac{1}{x}} \Rightarrow D: (-\infty, \frac{4}{3}) \cup [\frac{3}{2}, +\infty) - \{1\}$