زهرا آقایی

« بنام خدا »

گروه یازدهم دختران C

۱

$A\times B \Rightarrow \{(1,2)(1,3)(2,2)(2,3)(3,2)(2,3)\}$

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

۲

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

$m^2=m+2 \to m^2-m-2=0 \to (m-2)(m+1) \to \boxed{m=-1}$

$g(x) = \{(3,m^2)(2,1)(m,4)(3,m+2)(-2,m)(-1,3)\}$ $\quad \left.\begin{matrix} m=-1 \\ m=+2 \end{matrix}\right\}$ غ ق ق

$m^2=m+2 \to \to m^2-m-2=0,\ (m-2)(m+1) \to$

۳

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

$\to x=2,\ ax+b=x^3 \Rightarrow 2a+b=8 \to -2b+b=8$

$b=-8$

$a=8$

$\boxed{a\times b=-64}$

۴

$f(x) = \begin{cases} 2x-3 & x\geq k \\ 4-3x & x\leq k \end{cases}$ $\quad 2x-3=4-3x$

$5x=7 \to x=\frac{7}{5} \to \boxed{k=\frac{7}{5}}$

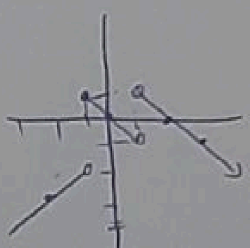
۵

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

1	2	3
1	0	-1

-1	0	1
1	0	-1

-1	-2	-3
-2	-3	-4



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

$R=(-\infty,1]$

۶

الف) $2y^3+x^2+1=0 \xrightarrow{x_1=x_2} y_1^3=\frac{-x^2-1}{2}$

$y_2^3=\frac{-x^2-1}{2} \Rightarrow y_1^3=y_2^3 \to y_1=y_2$ تابع

ب) $x^2+4y^2-2x-12y+10=0 \to (x-1)^2+(2y-3)^2=0 \to (1,\frac{3}{2})$ تابع

$x=1 \qquad y=\frac{3}{2}$

۷

الف) $x\sin y = y\sin x \to x=0$
$0\times\sin y = y\times\sin 0$ هر عددی $y \ne$ ، صفر $x, y \ne 0$

ب) $\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2$
توان ۲ $\to \left(\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}}\right)^2 = 4 \to \frac{x}{y} + \frac{y}{x} + 2 = 4 \to \frac{y}{x} + \frac{x}{y} = 2$
$x^2+y^2-2xy = 0 \quad (x-y)^2 = 0 \leftarrow \frac{x^2+y^2}{xy} = 2 \to x^2+y^2 = 2xy$
$\to x=y \to$ ثابت

۸

الف) $y = \sqrt{\frac{x-1}{x-3}} + \sqrt{\frac{2-x}{x}} \Rightarrow \frac{x-1}{x-3} \geq 0$ ، 1 ، 3 ؛ $(-\infty, 1] \cup (3, +\infty)$

$\frac{2-x}{x} \geq 0 \to x=0,\ x=2 \to (0, 2]$ $\qquad D = (0, 1]$

ب) $\sqrt{x} + \sqrt{y-1} = \sqrt{3} \quad \sqrt{y-1} = \sqrt{3} - \sqrt{x} \quad \sqrt{y-1} \geq 0 \to \sqrt{x} \geq 0$ I
$\sqrt{3} - \sqrt{x} \geq 0 \quad \sqrt{3} \geq \sqrt{x} \quad x \geq 3$ II $\cap$

$x = [0, 3]$

۹

الف) $\frac{\sqrt{x^2-7x+6}}{\sqrt{x^2-10x+16}} \quad x^2-7x+6 \geq 0 \quad (x-6)(x-1) \to x=1,\ x=6$

$x^2-10x+16 \geq 0 \to (x-8)(x-2) \to x=2,\ x=8 \quad \cap$

$D = (-\infty, 1] \cup [8, +\infty)$

ب) $\sqrt{\frac{x^2-7x+6}{x^2-10x+16}} = \frac{(x-6)(x-1)}{(x-8)(x-2)} \geq 0$ ؛ $1\ 2\ 6\ 8$ ؛ $D = (-\infty, 1] \cup (2, 6] \cup (8, +\infty)$

۱۰

الف) $y = \frac{\sqrt{2x^2-5x+3}}{\sqrt{2x^2-7x+5}} \to 2x^2-5x+3 \geq 0 \quad x = 1,\ \frac{3}{2}$ $\to (-\infty, 1] \cup [\frac{3}{2}, +\infty)$

$\to 2x^2-7x+5 \geq 0 \quad 1,\ \frac{5}{2} \to (-\infty, 1) \cup (\frac{5}{2}, +\infty)$

$D = (-\infty, 1) \cup [\frac{3}{2}, +\infty)$

ب) $y = \sqrt{\frac{2x^2-5x+3}{2x^2-7x+5}} \to \frac{(x-1)(x-\frac{3}{2})}{(x-1)(x-\frac{5}{2})}$

$\to$ $1\ \frac{3}{2}\ \frac{5}{2}$ ؛ $D = (-\infty, 1) \cup (1, \frac{3}{2}] \cup [\frac{5}{2}, +\infty)$