№1. $U = \{-5, -4, -3, -2, -1, 1, 2, 3, 4, 5\}$

$A = \{-2, -1, 3, 5\}$

$B = \{x : x^4 + 3x^3 - 7x^2 - 15x + 18 = 0\}$

	1	3	-7	-15	18
1	1	4	-3	-18	0
-2	1	2	-7	-4	
2	1	6	9	0	
-3	1	3	0		
-3	1	0			

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

$A = \{-2, -1, 3, 5\}$

$A \cup B = \{-3, -2, -1, 1, 2, 3, 5\}$

$A \cap B = \varnothing$

$(A \triangle B) \triangle A = (A \cup B) \triangle A = B$

$A \triangle B = (A \cup B) \setminus (A \cap B) = A \cup B$

$U = \{-5, -4, -3, -2, -1, 1, 2, 3, 4, 5\}$

$\chi_A = \{0, 0, 0, 1, 1, 0, 0, 1, 0, 1\}$

$\chi_B = \{0, 0, 1, 0, 0, 1, 1, 0, 0, 0\}$

№2.

$A = \{x : x^2 + y^2 - 4x \le 0\}$

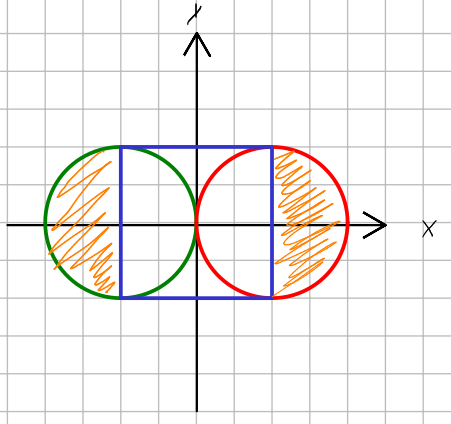
$(x-2)^2 + y^2 \le 4$

$B = \{x : x^2 + y^2 + 4x \le 0\}$

$(x+2)^2 + y^2 \le 4$

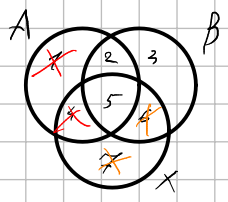
$C = \{x : |x| \le 2 \wedge |y| \le 2\}$

$(A \cup B) \triangle C$



№3.

$$\begin{cases} A \setminus B = \varnothing \\ X \setminus A = \varnothing \\ X \setminus B \neq \varnothing \end{cases}$$



$A \setminus B = \{1, 4\} \neq \varnothing$

$X \setminus A = \{6, 7\} \neq \varnothing$

$X \setminus B = \{4, 7\} \neq \varnothing$ подходит $\Rightarrow$

$\Rightarrow$ такие мн-ва есть

№4.

$\rho = \{(a,c), (c,a), (b,b), (a,b), (a,d)\}$

$A = \{a, b, c, d\}$

$$M(\rho) = \begin{array}{c} \\ a \\ b \\ c \\ d \end{array} \begin{array}{c} \begin{array}{cccc} a & b & c & d \end{array} \\ \begin{pmatrix} 0 & 1 & 1 & 1 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{pmatrix} \end{array} \qquad M(\rho^{-1}) = \begin{array}{c} \\ a \\ b \\ c \\ d \end{array} \begin{array}{c} \begin{array}{cccc} a & b & c & d \end{array} \\ \begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix} \end{array}$$

$$M(\rho \circ \rho) = \begin{pmatrix} 0 & 1 & 1 & 1 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{pmatrix} \cdot \begin{pmatrix} 0 & 1 & 1 & 1 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{pmatrix} = \begin{array}{c} \\ a \\ b \\ c \\ d \end{array} \begin{array}{c} \begin{array}{cccc} a & b & c & d \end{array} \\ \begin{pmatrix} 1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 1 & 1 & 1 \\ 0 & 0 & 0 & 0 \end{pmatrix} \end{array}$$

$$M(\rho \circ \rho^{-1}) = \begin{pmatrix} 0 & 1 & 1 & 1 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{pmatrix} \cdot \begin{pmatrix} 0 & 0 & 1 & 0 \\ 1 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix} = \begin{array}{c} \\ a \\ b \\ c \\ d \end{array} \begin{array}{c} \begin{array}{cccc} a & b & c & d \end{array} \\ \begin{pmatrix} 1 & 1 & 0 & 0 \\ 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 \end{pmatrix} \end{array}$$

$\rho \circ \rho = \{(a,a), (a,b), (b,b), (c,b), (c,c), (c,d)\}$

$\rho \circ \rho^{-1} = \{(a,a), (a,b), (c,c)\}$

$pr_2(\rho \circ \rho^{-1}) = \{a, b, c\}$

$pr_1(\rho \circ \rho) = \{a, b, c\}$

$pr_2(\rho \circ \rho^{-1}) \times pr_1(\rho \circ \rho) = \{(a,a), (a,b), (a,c), (b,a), \ldots\}$

№5.

$\rho \subseteq A \times A$, $\sigma \subseteq A \times A$, $A = \{1, 2, 3, 4, 5\}$

$$M(\rho) = \begin{array}{c} \\ 1 \\ 2 \\ 3 \\ 4 \\ 5 \end{array} \begin{array}{c} \begin{array}{ccccc} 1 & 2 & 3 & 4 & 5 \end{array} \\ \begin{pmatrix} 1 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 0 \\ 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 1 & 0 \\ 1 & 0 & 1 & 0 & 1 \end{pmatrix} \end{array}$$

$$M(\sigma) = \begin{array}{c} \\ 1 \\ 2 \\ 3 \\ 4 \\ 5 \end{array} \begin{array}{c} \begin{array}{ccccc} 1 & 2 & 3 & 4 & 5 \end{array} \\ \begin{pmatrix} 1 & 0 & 0 & 0 & 1 \\ 1 & 1 & 0 & 0 & 0 \\ 1 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix} \end{array}$$

рефл. а.-рефл. симм. а-симм. трансз. полн.

$$\begin{array}{c} \\ 1 \\ 2 \\ 3 \\ 4 \\ 5 \end{array} \begin{array}{c} \begin{array}{ccccc} 1 & 2 & 3 & 4 & 5 \end{array} \\ \begin{pmatrix} & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \end{pmatrix} \end{array}$$