

Name .....

	DA....	row ....	col....	
1.	2.	3.	4.	$\Sigma$

1. Write the mathematical formulas corresponding to the following statements with the help of the following signs only: propositional connectives, quantifiers, variables varying through set  $\mathbb{R}$  and symbols indicated in brackets

*linear function with all coefficients positive is increasing*( $\cdot, +, =, 1, >, 0$ )

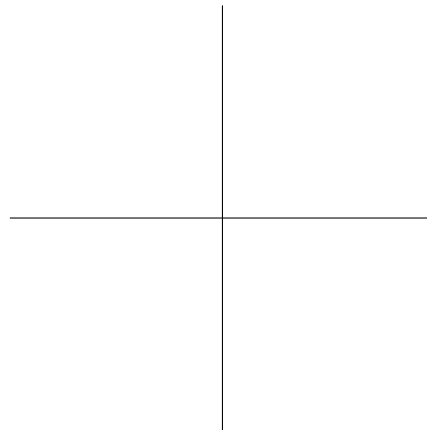
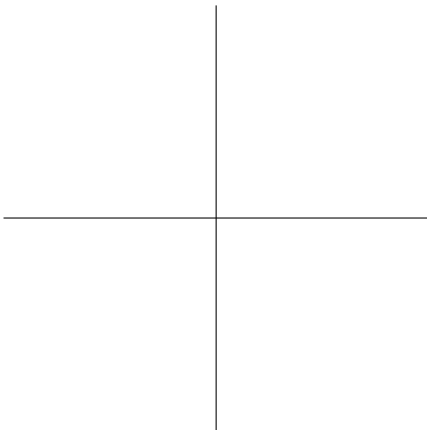
2. For what  $X$  the following holds.

$$\{\emptyset, \{X, \emptyset\}\} \in \{\emptyset, \{\emptyset\}, \{\emptyset, \{\emptyset\}\}\}$$

3. Find:

$$\bigcup_{a \in (0, \infty)} [a, \infty) \times (-\infty, a]$$

$$\bigcap_{a \in [0, 1]} [a, \infty) \times (-\infty, a]$$



4. Prove or disprove

a)  $(A \div B) \setminus (A \setminus C) = (A \cap \neg B \cap C) \cup (B \setminus A)$

b)  $(A \div B) \setminus (A \setminus C) = (B \setminus (A \setminus C)) \cup (A \cap C)$

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1. Write the mathematical formulas corresponding to the following statements with the help of the following signs only: propositional connectives, quantifiers, variables varying through set  $\mathbb{R}$  and symbols indicated in brackets

*linear function with all coefficients negative is decreasing*( $\cdot, +, =, 1, >, 0$ )

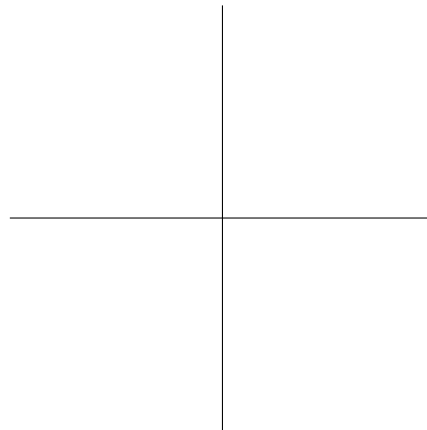
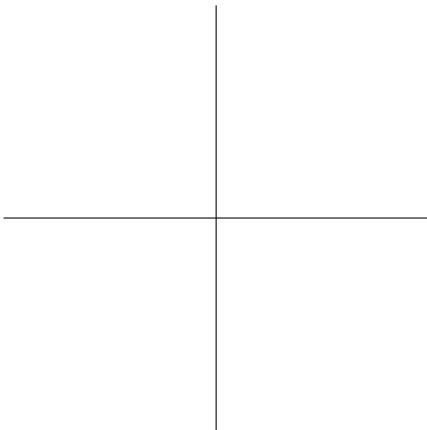
2. For what  $X$  the following holds.

$$\{\emptyset, \{X, \emptyset\}\} \subseteq \{\emptyset, \{\emptyset\}, \{\emptyset, \{\emptyset\}\}\}$$

3. Find:

$$\bigcap_{a \in [0,1]} (-\infty, a] \times (-\infty, -a]$$

$$\bigcup_{a \in [-\infty, 0)} (-\infty, a] \times (-\infty, -a]$$



4. Prove or disprove

a)  $(A \div C) \setminus (A \setminus B) = (A \cap B \cap \neg C) \cup (C \setminus A)$

b)  $(A \div C) \setminus (A \setminus B) = (C \setminus (A \setminus B)) \cup (A \cap B)$