

Name

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1.	2.	3.	Σ

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

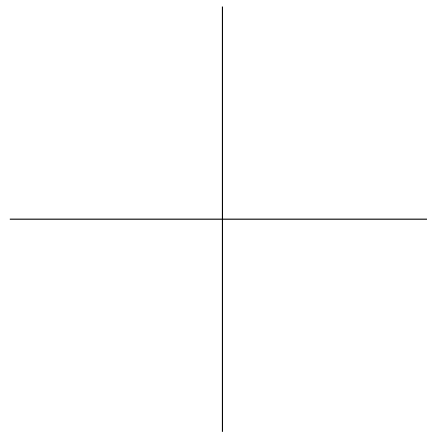
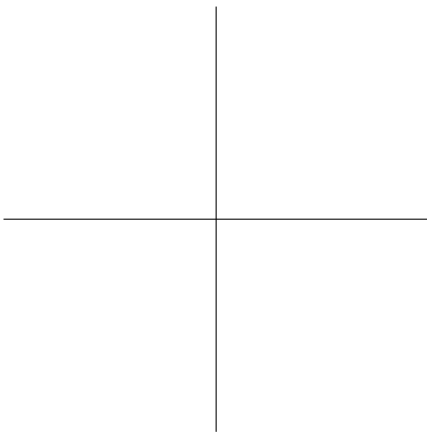
a) *1 is the only root of the function $f(f, =, 1, 0)$*

b) *1 is the smallest root of the function $f(f, =, \leq, 1, 0)$*

2. For $X_{a,b} = \{(x, y) \in \mathbb{R}^2 : y > a(x - b)(x + b)\}$ where $a, b \in \mathbb{R}$. Find:

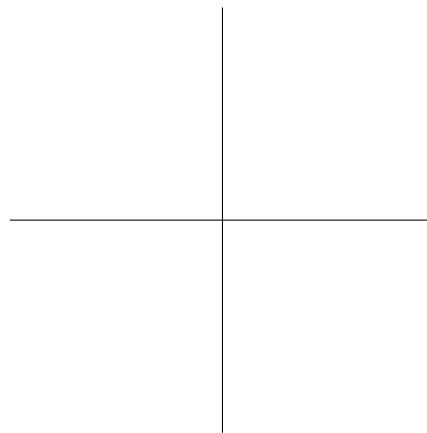
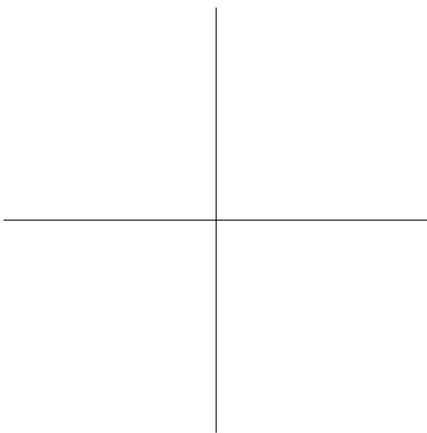
$$\bigcap_{a>0} X_{a,b}$$

$$\bigcup_{b>0} \bigcap_{a>0} X_{a,b}$$



$$\bigcup_{a \in \mathbb{R}} X_{a,b}$$

$$\bigcap_{b>0} \bigcup_{a \in \mathbb{R}} X_{a,b}$$



3. Proof or disproof

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

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