1. Show that \( \neg(p \land q) \) is logically equivalent to \((p \rightarrow q) \rightarrow \neg p\).

2. Show whether \( p \rightarrow p \) logically implies \( p \) or not.

3. Simplify \( \exists x P(x) \rightarrow \forall x \neg P(x) \) so that only one quantifier remains.

4. Find all cases in which \( A \times A \) contains the same number of elements as a given finite set \( A \).

5. Prove that \( \{\phi\} \) is a subset of any power set.