

Relations

1. Let A be a set and let $R = \emptyset \subset A \times A$ be the empty relation. Is R symmetric? Is R transitive? Is R reflexive?
2. There are 16 relations on a two element set (why?) For each of them decide if they are reflexive, symmetric, or transitive.
3. Let R be the relation on the integers such that aRb if and only if $a|b$. Prove that R is reflexive and transitive, but not symmetric.
4. Give an example of a relation on the integers which is:
 - not reflexive, but symmetric and transitive
 - reflexive, but neither symmetric nor transitive.
 - reflexive and symmetric, but not transitive.