MAT 119
Quiz #5
October 4, 2005

Name: ____________

Key

You may not use your notes. Please show all of your work. An answer without justification will receive little credit.

(1) Consider the relation $R$ defined on $2^\mathbb{Z}$ by $R = \{(A,B) : A,B \subseteq \mathbb{Z}; |A| = |B|\}$. Indicate whether $R$ has each of the following properties and if not give the reason that it does not:

Reflexive: **Yes**

Irreflexive: **No**, $513 \not\in R$, for example.

Symmetric: **Yes**

Antisymmetric: **No**, $513 \in R$ and $523 \in R$ but $513 \neq 523$

Transitive: **Yes**

(2) Let $A = \{1, 2, 3, 4\}$ and let $R = A \times A$. Then $R$ is a relation on $A$. Indicate whether $R$ has each of the following properties and if not give the reason that it does not:

Reflexive: **Yes**

Irreflexive: **No**, $(1,1) \in R$.

Symmetric: **Yes**.

Antisymmetric: **No**, $(1,2) \in R$ and $(2,1) \in R$ but $1 \neq 2$.

Transitive: **Yes**.