EECS 203-1
Homework 8– REVISED
Due March 7, 2002

Read Rosen Section 6.1, 6.3, 6.4 up to page 403
Exercises in Rosen:

- page 382: 4, 18, 28b, 36
- Does a relation on a set A which is symmetric and transitive necessarily have to be reflexive? Prove it or give a counterexample relation.
- page 395: 2, 8abc
- Page 407: 26ab
- Recall the recursive definition of transitive closure:

  > Given a binary relation R on a set A, we use the following rules to construct the relation $tc(R)$.
  >
  > 1. "Basis": if $(x, y) \in R$, then $(x, y) \in tc(R)$.
  > 2. "Induction": if $(x, y) \in tc(R)$ and $(y, z) \in tc(R)$, then $(x, z) \in tc(R)$.
  > 3. No pair is in $tc(R)$ unless it is shown there using a finite number of applications of rules 1 and 2.

  THE ORIGINAL PROBLEM WAS FALSE! Instead, prove by induction on n that if $(x, y) \in R^n$, then (x, y) can be shown to be in $tc(R)$ using *some* finite number of rule applications.