

COMPUTER SCIENCE 20, SPRING 2012
DISCRETE MATHEMATICS FOR COMPUTER SCIENCE
Class #17 (Graphs and Relations)

Homework, due in hard copy Friday 3/9/2012 at 10:10am

Please write your TF's name on your homework, and list the names of any students with whom you collaborated.

1. A directed tree, as defined previously, is a special type of directed graph that has the following properties:
 - there is exactly one node of in-degree 0, which we will call the root
 - for any vertex V in the tree, there is exactly one walk from the root to V

For each of the following properties, describe the subset of directed trees that represent a relationship with the given property, and prove that no other tree can have the property. (Hint: most trees will not satisfy most of these properties.)

- (a) Transitive
- (b) Reflexive
- (c) Symmetric
- (d) Antisymmetric