Quiz 1 CSCI 333 Fall 2002
4 September, 2002

Name: _____

This is the first of the six 30-minute quizzes of CSCI 333. This is an open book, open notes quiz. Be sure to show your work in order to get full credit for the problem. When possible place your answers in the provided boxes. There are two questions for a total of 20 points on this quiz.

Problem 1 (14 points)

In this problem, two relations are given on the integers from 0 to 15. For each of the relations, state if the relation is reflexive, transitive, symmetric, or antisymmetric. Justify your answers by giving a proof or counterexample.

For integers a and b from 0 to 15, $a \equiv b$ if and only if $a = 8$ or b = 8

reflexive	
transitive	
symmetric	
antisymmetric	

For integers a and b from 0 to 15, $a \equiv b$ if and only if $a*b = 49$.
Hint: This can only happen in the one case where both a and b equal 7.

reflexive	
transitive	
symmetric	
antisymmetric	

Problem 2 (6 points)

Use induction to prove that the function defined by the following recurrence relation:

$T(0) = 7$

$T(n) = T(n\text{-}1) + 5$, for $n \geq 1$

has the closed form solution

$T(n) = 5\,n + 7$