COT 3100 In-class Exercise 8

Name: USF ID:

Problem 1: Prove the statement by mathematical induction.

For all integers

Proof (by mathematical induction):

Let the property is the equation

Basic step: show that is true:

The left-hand side of is 1, and the right-hand side of is. Thus is true.

Inductive step: show that for all integers, if is true then is true.

Let be any integer with, and suppose is true. That is, suppose

(1)

We must show that is true. That is, we must show that

The left-hand side of is

by substituting eq. (1)

by algebra

And this is the right-hand side of. Hence, is true.

Since both the basic step and the inductive step have been proved, is true for all integers.

Problem 2:

Compute the summations