CSCI 1900 - Homework 8-B

# Section 1.1: Propositional Logic *(22)*

1. Which of the following are statements of proposition? (3)
   1. The first test in CSCI 1900 is scheduled for 13 February.
   2. x2 - x >12121
   3. Quit talking in class.
2. Negate the following: (4)
   1. Today is a rainy day.
   2. Tomorrow will be windy and will be sunny.
3. Determine if each of the following is true or false (4)
   1. 6 is a positive integer and 6 is greater than 7
   2. 5+5 <12 and 5 < 6
   3. 4+4 = 9 or 2 > 3
   4. 2+3 < 5+3 or 2 > 5

h = I do not like green eggs with ham.

p = Pigs can fly.

s = This is the spring semester.

1. Using logical connectives, write each of the following in terms of h, p, and s. (4)
   1. This is the spring semester and I like green eggs with ham
   2. This is the spring semester or pigs cannot fly
   3. I do not like green eggs with ham or this is not the spring semester
   4. This is not the spring semester but I like green eggs with ham

E(x): x is an even integer

O(x): x is an odd integer

P(x,y): x \* y is even

1. Write each of the following in terms of E(x), O(x), P(x,y) and the appropriate quantifiers. (4)
   1. Every integer is either even or odd
   2. The product of any two integers is even
   3. There are no integers which are both even and odd
   4. The product of any two consecutive integers is odd
2. Let be a logical binary operator as defined by the following truth table

|  |  |  |
| --- | --- | --- |
| *p* | *q* | *p q* |
| T | T | F |
| T | F | T |
| F | T | T |
| F | F | T |

Construct the truth table for . (1)

1. Let be a logical binary operator with the property that *p* *q* is true only if both *p* and *q* are false and is false otherwise. (2)
   1. Show the truth table for *p* *q*
   2. Construct the truth table for