## Assignment for Logic Lesson 1

1. Which of these are statements?

a. 5 > 3 b.  $2^3$  c. 6 = 1 + 4 d. x + 2 = 6 e. Stop that man!

- 2. True or False?
  - A negation of: "Every rectangle is a square" is "Some rectangles are not squares"
  - If  $p \wedge q$  is false then q must be false.
  - A negation of : "Every rectangle is a square" is "No rectangles are squares"
- 3. Tell whether a)  $p \wedge q$  is true or false, b)  $p \vee q$  is true or false
  - p: every triangle has 3 sides
  - q: every square has 4 right angles
- 4. Write the negation of the following:
  - a)  $2+3 \neq 7$ b) Some geometry students take French c)  $6^2-8<25$ d) 5>4+1 and  $6\leq 3$
- 5. Tell whether each statement above is true or false.
- 6. Fill in the blanks.
- The negation of  $p \wedge q$  is \_\_\_\_\_

The negation of a false statement is (always, sometimes, never) true. The symbol  $\land$  means \_\_\_\_\_\_. The symbol  $\lor$  means \_\_\_\_\_\_. The negation of  $p \lor q$  is \_\_\_\_\_\_.

7. Complete the truth table for the following statement:  $\sim p \lor \sim q$ 

р	q	$\sim p$	$\sim q$	$\sim p \lor \sim q$

- 8. Mark the hypothesis and the conclusion for each statement:
  - a) if it rains, then the streets get wet b) x = 2 if  $x^2$
  - c) I save my allowance, if I can go to the movies d)

b) x = 2 if  $x^2 = 4$ d) x + 2 > 6 follows from x > 4

9. Construct a truth table for  $p \rightarrow q$ 

10. Assign p and q to the statements in such a way that  $p \rightarrow q$  is true. If no such assignment can be made, write *impossible*.

a)  $n^2 = 25$ , n = 5b) A is on line BC, A is on segment BC c) Jim is old, Jim is a person d) B is between A and C, B is on segment AD

11. Complete the truth table to prove that  $(p \land q) \rightarrow p$  is true for all combinations of truth values of p and q.

р	q	$p \wedge q$	$(p \land q) \to p$
Т	Т		
Т	F		
F	Т		
F	F		