Name:  
LAB #1.1 Date:

Objectives:

* Be able to write/determine a proposition
* Be able to combine propositions using logical operators
* Be able to construct truth table
* Be able to express a proposition as an English sentence

Exercise 1:   
A. Which of these sentences are propositions? If it is a proposition, determine its truth value. If not, explain why.  
B. If a sentence is a proposition, write down its negation.  
a. Boston is the capital of Massachusetts.  
Yes. True. Negation: Boston is not the capital of Massachusetts.  
b. x + 2 = 10.  
Not a proposition because x can be any values.   
c. What time is it?  
Not a proposition because it is a question.  
d.   
Yes. False. Negation:   
e. 120 is a perfect square.

Yes. False. Negation: 120 is not a perfect square.  
  
Exercise 2: Construct a truth table for

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |
| T | T | T | T | T | T | T |
| T | T | T | F | T | T | F |
| T | T | F | T | T | F | F |
| T | T | F | F | T | F | T |
| T | F | T | T | F | T | T |
| T | F | T | F | F | T | F |
| T | F | F | T | F | T | T |
| T | F | F | F | F | T | F |
| F | T | T | T | T | T | T |
| F | T | T | F | T | T | F |
| F | T | F | T | T | F | F |
| F | T | F | F | T | F | T |
| F | F | T | T | T | T | T |
| F | F | T | F | T | T | F |
| F | F | F | T | T | F | F |
| F | F | F | F | T | F | T |

Exercise 3: Let p and q be the propositions  
: You drive over 65 miles per hour.  
: You get a speeding ticket.  
Write these propositions using p and q and logical connectives (including negations)  
a. You do not drive over 65 miles per hour.  
   
  
b. Whenever you get a speeding ticket, you are driving over 65 miles per hour  
   
  
c. If you do not drive over 65 miles per hour, then you will not get a speeding ticket.  
   
  
d. You drive over 65 miles per hour, but you do not get a speeding ticket.  
   
  
e. You will get a speeding ticket if and only if you drive over 65 miles per hour.   
   
  
f. You do not get a speeding ticket unless you drive over 65 miles per hour.