**CSC175 Practice Assignment 3 Spring 2019 Name \_\_\_\_\_\_\_\_\_Donald Tvedt\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Directions:** Download this file and save as lastnamePracticeAssignment3SP19. Type all solutions on this document. Use equation editor when necessary. Upload Word document to Blackboard by **Saturday at 11:59 AM.  
Please color, highlight, and/or bold your work to differentiate it from the original questions. Thank you.**  
Directions for equation editor: Choose INSERT tab, Click Equation (far right), and explore all of your options!

1) Given the following propositions, write out the English sentences for the given the symbolic forms.   
 = Jim likes mathematics = Jim likes computer science = Jim likes Sudoku puzzles

a) = **Jim likes computer science or Jim does not like Sudoku puzzles**  
b) = **Jim does not like mathematics if and only if Jim does not like computer science**  
c) = **If Jim likes mathematics and Jim likes Sudoku puzzles then Jim likes computer science**

2) Given the following English sentences which are compound propositions, label each simple proposition with a variable and then give the symbolic form. Each simple proposition should NOT include the word “not” in it.

a) 209 is not a prime number and 347 is a prime number. **Compound YES**

**= 209 is a prime number = 347 is a prime number**    
b) If 111 is a prime number, then 347 is not a prime number or 209 is a prime number. **Compound YES**

**= 111 is a prime number = 347 is a prime number = 209 is a prime number**   
c) 347 is a prime number and 111 is not a prime number if and only if 209 is a prime number or 347 is not a prime number. **Compound YES**

**= 347 is a prime number = 111 is a prime number = 209 is a prime number**d) 347 is a prime number if 111 is not a prime number. **Compound YES**

**= 347 is a prime number = 111 is a prime number**

3) Write the negation of each compound proposition as an English sentence.

a) If mom wants to go to Disneyland then dad will pay for it.

**If mom does not want to go to Disneyland then dad will not pay for it**  
 b) The kids want to go to Disneyland and dad does not want to pay for it.

**The kids do not want to go to Disneyland and dad does want to pay for it**  
 c) If dad wants to go to the Super Bowl, then the kids can’t go to Disneyland or mom needs a second job.

**If dad does not want to go to the Super Bowl, then the kids can go to Disneyland or mom does not need**

**a second job**

4) Find the complete truth table for each compound sentence. Be such to order the columns as shown in discussion and in the videos. Use the table builder in the INSERT tab.

a)

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

b)

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

c)

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

d)

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

5) Use a truth table to determine if is a tautology, contradiction, or neither. Show the complete truth table and explain why you believe your answer is correct. **Answer = This is a tautology it is True in all cases.**

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

6) Use a truth table to determine if is equivalent to . Show the complete truth table and explain why you believe your answer is correct. **Answer = is equivalent to**

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

7) Name the law (or laws if two are used) from pages 58-59 that is used in each equivalence. (DO NOT CREATE A TRUTH TABLE.)

a) **= Commutative Law**  
b) **= Associative Laws**  
c) **= Chain Rule**  
d) **= Commutation Law**  
e) **= DeMorgan’s Law**