Foundations of Discrete Mathematics
COT 2104

Practice 1

1. Let p and q be the propositions.

   p: I bought a lottery ticket this week.
   q: I won the million dollar jackpot on Saturday.

   Express each of these propositions as an English sentence.

   a. $\neg p$
   b. $p \vee q$
   c. $\neg q \rightarrow p$
   d. $p \leftrightarrow \neg q$
   e. $\neg q \vee (p \wedge q)$

2. Let p, q, and r be the propositions.

   p: You get an A on the final exam.
   q: You do every exercise in this book.
   r: You get an A in this class.
   Write these propositions using p, q, and r and logical connectives

a) You get A in this class, but you do not every exercise in this book.
b) To get an A in this class, it is necessary for you to get an A on the final.
c) Getting an A on the final and doing every exercise in this book is sufficient for getting an A in this class.

3. State the converse, contrapositive, and inverse of each of these implications.

a) If it snows tonight, then I will stay at home.
b) I go to the beach whenever it is a sunny summer day.
c) When I stay up late, it is necessary that I sleep until noon.