Math 2001
Practice with Conditional and Biconditional Statements

1. Give the truth table for $P \Rightarrow Q$.

2. Fill in the blanks below so that all of the statements below are equivalent to the conditional statement $P \Rightarrow Q$.
   - If ____ then ____.
   - ____, if ____.
   - ____, whenever ____.
   - ____ only if ____.
   - ____ is a sufficient condition for ____.
   - ____ is a necessary condition for ____.
   - ____, provided ____.

3. Suppose that X is a mome rath whenever X is a borogove. Which of the following is true?
   (a) If X is a mome rath, then X is a borogove.
   (b) X is a mome rath only if X is a borogove.
   (c) Being a mome rath is a sufficient condition for being a borogove.
   (d) Being a mome rath is a necessary condition for being a borogove.
   (e) To be a mome rath, it is necessary to be a borogove.

4. Rephrase the following statement into "If-then" form:
   "An integer is prime only if 2 does not divide it".
   Is the statement true? Is the converse true?

5. Give the truth table for $P \Leftrightarrow Q$.

6. Write the biconditional statement $P \Leftrightarrow Q$ in words, in three distinct ways.

7. Rephrase the biconditional "The triangle ΔABC is isosceles if and only if $\angle A \cong \angle B$" in another way. Is the biconditional statement true or false? Explain.