MAT 222-840 **Discussion Questions for Chapter 2** Spring 2017

Due: 2/7/17 at 5:00PM

Instructions: Your answers to the following questions do not need to be lengthy or written in complete sentences, but should reflect preparation for our discussion about Chapter 2 at the beginning of class.

Questions:

1. Does inductive reasoning guarantee that a conjecture is true?

   No; Inductive reasoning is based on observing patterns or specific examples. This does not prove that the conjecture is true in all possible cases.

2. How many counterexamples are needed to prove that a conjecture is false?

   Only one counterexample is needed. A conjecture is only true if it is true in all possible cases, so finding one case in which it is not true proves that a conjecture is false.

3. How do you form the contrapositive of a conditional statement?

   Negate the hypothesis and conclusion of the original statement, then reverse the two. Alternatively, negate the hypothesis and conclusion of the converse statement.

4. Which pairs of a group of four related conditional statements are logically equivalent?

   The original conditional and its contrapositive are logically equivalent.

   The converse and the inverse are logically equivalent.

5. What is the key phrase for a biconditional statement?

   if and only if

6. What must be true for a biconditional statement to be true?

   Both a conditional and its converse must be true.

7. Why can't a proof be based on inductive reasoning?

   Inductive reasoning is based on specific examples, so it may lead to a conclusion that is not true because it is not true in all cases.

8. Which law of deductive reasoning is similar to the transitive property of equality?

   The Law of Syllogism

9. How can you translate a conditional statement into the "Given" and "Prove" for a proof?

   The hypothesis, or "if" statement, becomes the "Given" and the conclusion or "then" statement becomes the "Prove."

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Muddiest Point:

What questions do you have about the notes you took in Chapter 2, or anything from this week?

MML Homework Questions:

Are there any MML homework problems from Chapter 2 that you would like to discuss?