

## Ma 086 ~ Mathematical Reasoning PreTest Study Guide

For this test, you will have to demonstrate proficiency in the following skills:

- Discerning the difference between conclusions reached by *Deductive Reasoning\** and *Inductive Reasoning\**.
- Reasoning inductively (find the pattern in a set of numbers or figures).
- Solving problems that require understanding of the definition of Complementary and Supplementary angles (review) as well as Vertical Angles and sets of angles that form a complete circle.
- Finding the perimeter or area of figures even when certain dimensions are left out and must be inferred.
- Knowing how to apply the *Angle Addition Postulate\** as well as the *Segment Addition Postulate\**.
- Knowing how to apply the *Reflexive\* Property of Equality* and of *Congruence* (same property—just one applies to numbers and the other to shapes), as well as the *Symmetric\** and *Transitive\** properties.
- Knowing how to apply the *Addition Property of Equality\** as well as the *Subtraction\**, *Multiplication\**, and *Division\** properties.
- Correctly interpreting the symbols  $\wedge$ ,  $\vee$ , and  $\neg$  in the context of mathematical reasoning and correctly setting up and using truth tables to determine whether a statement is true or false (Ex: If  $p$  is true and  $q$  is false, what is the value of  $\neg p \wedge q$ ?)
- Knowing the meaning and correct use of the following terms in the context of mathematical reasoning: *Converse\**, *Inverse\** and *Contrapositive\**; *Conjunction\** and *Disjunction\**; *Counterexample\**; and *Biconditional\**.
- Correctly identifying the statements that can be put together to form a conclusion that follows the *Law of Syllogism\**.
- Correctly identifying the statements that can be put together to form a conclusion that follows the *Law of Detachment\**.
- Applying any of the above to a real-world situation.

*\*You may look up and write down the definitions/theorems needed for these problems and have that paper with you when you take the test.*