MA 110-91 §1.1 – 2.4	**Test #1**	*score*	**Name:** _____ **1 March 2003**

1. Use a properly labeled Venn diagram to determine the validity of the following argument. Explain. *(9 points)*

   1. All master photographers are artists.
   2. Ansel Adams is an artist.

   Therefore, Ansel Adams is a master photographer.

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2. Use truth tables to determine if the statements $p \rightarrow q$ and $\sim p \vee q$ are logically equivalent. *(9 points)*

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3. Determine which pairs of statements are equivalent: *(9 points)*

   (a) I am a rebel if I do not have a cause.

   (b) I am a rebel only if I do not have a cause.

   (c) I am not a rebel if I have a cause.

   (d) If I am not a rebel, I have a cause.

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4. Write the following argument in symbolic form. Then use a truth table to determine if the argument is valid. *(10 points)*

   If you give me that umbrella today, I will pay you tomorrow. If you are a sensitive person, you will give me that umbrella today. You are not a sensitive person. Therefore, you do not give me the umbrella today.

5. If $U = \{a, b, c, d, e, f, g, h, i, j, k, l, m\}$, $A = \{a, b, d, e, g, h\}$ and $B = \{b, c, e, f, h, i\}$, enumerate (write out) the set $A \cap B'$. *(9 points)*

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6. Draw a Venn diagram that illustrates the set $A \cup (B \cap C)$. *(9 points)*

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7. In a group of 287 students, 146 play tennis, 162 play racquetball, and 61 play neither? How many of the students play both tennis and racquetball?

   Draw a properly labelled Venn diagram and explain your reasoning. *(9 points)*

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8. In how many ways can 9 different people all be lined up in a row? If three of the 9 must be lined up consecutively, in how many ways can this be done? *(9 points)*

9. From a group of 6 men and 8 women, how many different 5-person committees can be formed consisting of 3 women and 2 men? Explain your counting argument. *(9 points)*

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10. How many different identification sequences can be generated that consist of three letters (all caps) followed by three digits (0-9) if the letters must be distinct? Explain. *(9 points)*

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11. How many different 5-card hands are there? Of these, how many have exactly 4 cards in one suit and the other card from a different suit? Explain your counting argument. *(9 points)*