You MUST use good notation and show appropriate work.

Math 102 (Section 1.3; 1.4)

Name _____

1.3 Language of Sets

- 1. Explain the difference between \emptyset and $\{\emptyset\}$ in your own words.
- 2. Use proper set notation and the listing method (roster method) to express each of the following as a set:
 - (a) the set of multiples of five between 2 and 38.
 - (b) the set of integers which when squared equal 9.
 - (c) the set of integers which when squared equal 7.
- 3. Express each as a set using set builder notation.
 - (a) $\{1, 4, 9, 16, 25, 36, 49\}$
 - (b) $\{3, 6, 12, 15, \ldots\}$
- 4. Determine the cardinal number, n(A), for each of the following sets.
 - (a) $A = \{x: x \text{ is a letter in our alphabet}\}$
 - (b) $A = \{1, 0, \emptyset, \{\emptyset\}\}$
 - (c) $A = \{x: x \text{ is a letter in the word "Mississippi"}\}$

1.4 Comparing Sets

- 5. Assume A and B are two nonempty sets. Explain the meaning of each of the following in your own words.(a) A equals B.
 - (b) A is equivalent to **B**.
- 6. Assume A is a set such that n(A) = 6.
 (a) Determine the number of distinct subsets of A.
 - (b) Determine the number of distinct proper subsets of A.
 - (c) Using Pascal's Triangle (without proof see page 41), how many different subsets of size 3 can be formed using elements from *A*?

- 7. Classify each by writing "*true*" or "*false*" in the blank provided.
 (a) {a, b, c} = {b, c, a}
 - (b) $n(\{a, b.c\}) = n(\{1, 2, 3\})$
 - (c) $\{b\} \in \{a, b\}$
 - (d) $\{0,1\} \subset \{0, \{0,1\}, 2\}$ (be careful)
 - (e) $\{\{0,1\}\} \subseteq \{0,\{0,1\},2\}$
 - (f) $\{2, 4, 6\}$ and $\{4, 6, 8\}$ are equivalent sets.
 - (g) $\{\emptyset\}$ and $\{0\}$ are equivalent sets.