1 .3 Language of Sets

1. Explain the difference between Ø and {Ø} in your own words.

2. Express each of the following as a set *both* in set-builder notation **and** in roster notation:

(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, ... }

4.   Determine the cardinal number, $n(A)$, for each of the following sets:

(a)   A = {x: x is a letter in our alphabet}   _____

(b)   A = {1, 0, Ø, {Ø}}   _____

(c)   A = {x: x is a letter in the word "Mississippi"}   _____

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) $\{\varnothing\}$ and $\{0\}$ are equivalent sets.   _____