Math 164
Fall, 2009
Quiz 2 - §§1.3, 2.1, 2.2

Name: **Solutions**

For each of the following problems, circle T if the statement is always true and F if the statement is sometimes false. There is no partial credit on this part of the quiz. For each of the following problems use the sets:

$$U = \{a, b, c, d, e, f, g\}$$
$$A = \{a, e\}$$
$$B = \{a, b, e, f, g\}$$
$$C = \{b, f, g\}$$
$$D = \{d, e\}$$

1. T F $\{b\} \subseteq C$

   This is TRUE since $b \in \{b\}$ and $b \in C$ and there are no other elements to check.

2. T F $\{b\} \in C$

   This is FALSE since there is no element named '$\{b\}$' in the set C.

3. T F $\emptyset \subseteq A$

   This is TRUE. The empty set is a subset of every set.

4. T F $D \subseteq A$

   This is FALSE. D contains the element d which is not an element of A.

5. T F $C \subseteq U$

   This is TRUE. U is the universal set and all other sets are subsets of U. Notice that you can also check that every element of C is also in U.

6. T F $\emptyset \subset \emptyset$

   This is FALSE. To be a proper subset, we would need the empty set to be a subset of the empty set (which it is), but for $\emptyset \neq \emptyset$. However, the sets are equal, so they are not PROPER subsets.

7. T F $\emptyset \in U$

   This is FALSE. The empty set is not a member of (or element of) the set U.

   Complete the following problem. Show all work, including an explanation, to receive full credit.

8. Some months have 30 days and some have 31 days. How many months have 28 days?

   All months have 28 days. Some months also have more days, but all months have 28.