CSC 300: Assignment 4

Total: 30 pts

1. (2x4 pts) Determine whether the following statements are true or false
   a) $\emptyset \in \emptyset$
   b) $\emptyset \subset \emptyset$
   c) $\emptyset \in \emptyset$
   d) $\emptyset \subset \emptyset, \emptyset$

2. (5 pts) Use a Venn diagram to illustrate the relationship $A \subset B$ and $A \subset C$

3. (3x3 pts) Determine whether each of these sets is the power set of some set (specify this set whenever so), where $a, b$ are distinct elements (e.g., $\{\emptyset, a\}$ is the power set of $\{a\}$)
   a) $\emptyset$
   b) $\emptyset, \emptyset, a, \emptyset, a$ (hint: look carefully)
   c) $\emptyset, a, b, a, b$

4. (2x4 pts) Suppose that
   A is the set of sophomores at your school
   B is the set of students in discrete math at your school
   Express each of these sets in terms of A and B, using set operations
   a) the set of sophomores taking discrete math in your school
   b) the set of sophomores at your school who who are not taking discrete math
   c) the set of students at your school who either are sophomores or are taking discrete math
   d) the set of students at your school who either are not sophomores or are not taking discrete math