Committees

1. Consider the following axioms for a certain committee structure:

   A. There are exactly four people.

   B. There are exactly four committees.

   C. Each committee consists of exactly two people.

   D. No two committees have the same set of people as members.

   (a) Is this system consistent?

   (b) If so, for each axiom, determine whether or not it is independent of the others.

   (c) Is this system categorical?

2. Consider the following axioms for a certain committee structure:

   A. There are exactly four people.

   B. There are exactly five committees.

   C. Each committee consists of exactly two people.

   D. No two committees have the same set of people as members.

   (a) Is this system consistent?

   (b) If so, for each axiom, determine whether or not it is independent of the others.

   (c) Is this system categorical?

3. Consider the following axioms for a certain committee structure:

   A. There are exactly four people.

   B. There are exactly six committees.

   C. Each committee consists of exactly two people.

   D. No two committees have the same set of people as members.

   E. Each person serves on exactly three committees.

   (a) Is this system consistent?

(b) If so, for each axiom, determine whether or not it is independent of the others.

(c) Is this system categorical?

4. Consider the following axioms for a certain committee structure:

    A. There are exactly four people.

    B. There are exactly seven committees.

    C. Each committee consists of exactly two people.

    D. No two committees have the same set of people as members.

(a) Is this system consistent?

(b) If so, for each axiom, determine whether or not it is independent of the others.

(c) Is this system categorical?