CSE 321: Discrete Structures
Autumn 2008

Assignment #5
Due: Wednesday, November 12

Problems:

1. Which of the following statements is true?

   (a) $\{x\} \subseteq \{x\}$

   (b) $\{x\} \in \{x, \{x\}\}$

   (c) $\{x\} \in \{x\}$

   (d) $\{x, \{x\}\} \subseteq \mathcal{P}(\{x\})$

   (e) $\emptyset \in \emptyset$

   (f) $\emptyset \in \mathcal{P}(\emptyset)$

   (g) $\emptyset \subseteq \{x\}$

   (h) $\{\emptyset\} \subseteq \emptyset$

2. Can you conclude that $A = B$ if A, B, C are sets such that

   (a) $A \cup C = B \cup C$

   (b) $A \cap C = B \cap C$

   (c) $A \cup B = B \cup C$ and $A \cap C = B \cap C$

   Justify your answers.

3. Section 5.1, exercise 44

4. Section 5.1, exercise 58

5. In a dinner party with n people, all of them are seated at a circular table. Suppose there is a name tag at each place of the table, and suppose that nobody sits down in their correct place. Show that it is possible to rotate the table so that at least two people are sitting in the correct place.

6. Section 5.2, exercise 10

7. Section 5.3, exercise 22

8. Section 5.3, exercise 28

9. Section 5.3, exercise 30

   Please write about how many hours it took you to complete this assignment near where you write your name on the first page.