

**Instructions**

- Answer each question completely; justify your answers.
- This assignment is due at 4:00 pm on 28 January 2008.

1. Exercise 0.2.8
2. Exercise 0.2.14
3. Exercise 0.2.25
4. Exercise 1.1.1 (except parts (a) and (d))
5. Exercise 1.1.2, part (a)
6. Exercise 1.1.6
7. Exercise 2.1.1 (except parts (a) and (c))
8. Let  $A = \{1, 3, 4, 8\}$ ,  $B = \{3, 7, 9\}$ , and  $C = \{2, 4, 6, 7\}$ .
  - (a) Draw a Venn diagram showing the relationship between the sets. Label each element.
  - (b) What are:
    - i.  $A \cap B$
    - ii.  $B \cup C$
    - iii.  $A \cup (B \cap C)$
    - iv.  $(A \cup B) \cap C$
    - v.  $A \setminus (B \cap C)$
    - vi.  $(B \cup C) \setminus A$
    - vii.  $\mathcal{P}(B)$
9. Let  $A = \{a, b, \{b, c, d\}, \{c, d, e, f\}, f, g, \{g, h\}\}$ .
  - (a) What is  $|A|$ ?
  - (b) Indicate whether the following statements are true or false:
    - i.  $b \in A$
    - ii.  $c \in A$
    - iii.  $d \in A$
    - iv.  $\emptyset \in A$
    - v.  $\emptyset \subseteq A$
    - vi.  $g \subseteq A$
    - vii.  $\{b, c, d\} \subseteq A$
    - viii.  $\{b, c, d\} \in A$
    - ix.  $\{f, g\} \subseteq A$
    - x.  $\{f, g\} \in A$
    - xi.  $\{a, f, \{g, h\}\} \subseteq A$