

## Preparatory Exercise, Week 1 (Total: 10 marks)

Please submit to Rm LF21 by Monday 9:00am on 6 October 2008

### 1. (10 marks)

Recapitulate the basics of sets, relations and functions from one of the following.

- Chapter 5.2 in Cormen, T. H. and Leiserson, C. E. and Rivest, R. L. (1992), Introduction to Algorithms. The MIT Electrical Engineering and Computer Science Series, MIT Press.
- Chapter 1.1 and 1.3 of "Interactive Real Analysis" (<http://www.shu.edu/projects/real/analysis/index.html>, Website at Seton Hall University). This website includes interactive exercises with answers.
- Any book on the mathematical foundations of CS or discrete mathematics.

Give examples of binary relations that are

- (a) reflexive and symmetric but not transitive,
- (b) reflexive and transitive but not symmetric,
- (c) symmetric and transitive but not reflexive.

In each case give brief reasons.

You only need to hand in your answers to (1a)–(1c).