

## 14. Tutorial Analysis II for MCS Summer Term 2006

### (T14.1)

- (i) Read page 39 of the script (Contraction Mapping Principle).
- (ii) Prove the uniqueness part of the theorem.
- (iii) Read the proof of the Contraction Mapping Principle (pp. 40–41).

### (T14.2)

Let  $(X, d)$  be a complete metric space and suppose  $T : X \rightarrow X$  is a function for which  $T^N$  is a contraction for some  $N \in \mathbb{N}$ . Prove that  $T$  has a unique fixed point.