

Exercises for February 22–28

17.3

26.4, 26.9, 26.10, 26.14

Additional exercise. Consider \mathbb{Q} as a metric space with metric $d(r, s) = |r - s|$.

(1) Show that \mathbb{Q} σ -compact (that is, it is the union of a sequence of compact subsets), but the space $C_c(\mathbb{Q})$ of continuous compactly supported functions on \mathbb{Q} is zero. Define a finite measure on \mathbb{Q} and conclude that Theorem 17.8 in the book is wrong.

(2) Find a mistake in the proof of Theorem 17.8.