1. Give an example of the following:
   (a) a complete metric space that is bounded but not compact;
   (b) a metric space none of whose closed balls is complete

2. Let $f: (a, b) \to \mathbb{R}$ be increasing. Prove that $f$ has only countably many discontinuities. Hint: for each $x \in \mathbb{R}$ consider the interval $(f(x-), f(x+))$, and prove that every pairwise-disjoint family of open intervals is countable.