

- 3.3.10 The only sets which are "compact" are finite collections of real number singletons and the empty set. Otherwise if a set has a non-zero length then one can scale a copy of $\bigcup_{n=0}^{\infty} [2^{-(n+1)}, 2^{-n}]$ to be shorter than whatever length given and translated to be inside the set. Once inside the set, there is no finite sub cover of the sets given which can be chosen to still cover the set, as they fit together exactly to form the interval $[0, 1/2]$.