



# Metric Completion

## 1 Why

We can always work with complete metric spaces.

The justification is that we can always, given an incomplete metric space, construct a larger metric space which contains a subset isomorphic to the original one.

## 2 Result

**Proposition 1.** *Let  $(A, d)$  be an incomplete metric space. There exists a complete metric space  $(B, d')$  with  $C \subset B$  such that  $(A, d)$  and  $(C, d')$  are isometric and the image under the isometry of  $C$  is dense in  $B$ .*