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.*