

Worksheet §14.1

For the following, you may use the

Fact. *The relation of two sets having the same cardinality is an equivalence relation.*

1. Show that \mathbb{N} and \mathbb{Z} have the same cardinality.
2. Show that \mathbb{N} and $\mathbb{N} \times \mathbb{N}$ have the same cardinality.
3. Show that \mathbb{N} and \mathbb{N}^3 have the same cardinality. How about \mathbb{N} and \mathbb{N}^r for $r \in \mathbb{N}$?
4. Show that $[0, 1]$ and $[0, 100]$ have the same cardinality.
5. Show that $(0, 1)$ and $(1, \infty)$ have the same cardinality.
6. Show that $(0, 1)$ and \mathbb{R} have the same cardinality.
7. Prove the Fact.