

Cardinalities

March 29, 2020

Your mission, should you choose to accept it, is to determine which of the following sets have the same cardinality, and which different:

1. \mathbb{N}
2. \mathbb{Z}
3. $2\mathbb{Z} = \{2x : x \in \mathbb{Z}\}$
4. $\mathbb{Z} \times \mathbb{Z}$
5. \mathbb{Q}
6. $\mathbb{Q} \cap [0, 1]$
7. $\mathbb{Q}_1 = \{1/b : b \in \mathbb{Z}\}$
8. $\mathbb{Q}_{1,2} = \{a/b : b \in \mathbb{Z}, a \in \{1, 2\}\}$
9. \mathbb{R}
10. $(0, \infty)$
11. $(0, 1)$
12. $\mathcal{P}(\mathbb{N})$
13. $\mathcal{P}(\mathbb{Q})$
14. $\mathcal{P}(\mathbb{R})$