

\mathbb{Z}

\mathbb{Z} is countable, consider the function

$$f(n) = \begin{cases} n/2, & n \text{ even,} \\ (1-n)/2, & n \text{ odd.} \end{cases}$$

n	1	2	3	4	5	6	7	8	9
$f(n)$	0	1	-1	2	-2	3	-3	4	-4

Bijection

We can show it is a bijection directly, or we can exhibit an inverse function:

$$f^{-1}(a) = \begin{cases} 2a, & a > 0, \\ 1 - 2a, & a \leq 0 \end{cases}$$