

Lesson Ten: Tables

We can use the `\tabular` environment in a variety of ways.

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The following represents a bijection between the naturals and the even naturals.

Naturals	1	2	3	4	5	6	...	n	...
	\downarrow	\downarrow	\downarrow	\downarrow	\downarrow	\downarrow		\downarrow	
Even naturals	2	4	6	8	10	12	...	$2n$...

TABLE 1. Illustration of a bijection.

Exercise Ten: Tables

Below is the operation table (or Cayley table) for (\mathbb{Z}_4, \cdot_4) , that is, the integers *modulo* 4 under multiplication. Ask yourself whether or not this forms a group.

\cdot_4	0	1	2	3
0	0	0	0	0
1	0	1	2	3
2	0	2	0	2
3	0	3	2	1

Ah, truth tables ... good times.

This one demonstrates why “proof by contrapositive” works by showing that the statements $P \Rightarrow Q$ and $(\sim Q) \Rightarrow (\sim P)$ have the same truth values.

P	Q	$P \Rightarrow Q$	$\sim P$	$\sim Q$	$(\sim Q) \Rightarrow (\sim P)$
T	T	T	F	F	T
T	F	F	F	T	F
F	T	T	T	F	T
F	F	T	T	T	T

TABLE 2. Proof by contrapositive