

Contents

0.1	Cardinality	1
0.1.1	Cardinality of cartesian product	1
0.1.2	Cardinality of union and intersection	1
0.1.3	Cardinality of powerset	1
0.1.4	Cardinality of complement	1
0.1.5	Cardinality of even/odd natural numbers	1

0.1 Cardinality

0.1.1 Cardinality of cartesian product

What about the cardinality of Cartesian products? So if we have sets:

$$\{1, 2, 3\}$$

$$\{a, b\}$$

We can have the Cartesian product set:

$$\{(1, a), (2, a), (3, a), (1, b), (2, b), (3, b)\}$$

We can see that:

$$|A.B| = |A|.|B|$$

0.1.2 Cardinality of union and intersection

$$|A \vee B| = |A| + |B| - |A \wedge B|$$

0.1.3 Cardinality of powerset

$$|P(s)| = 2^{|s|}$$

0.1.4 Cardinality of complement

$$|a \setminus b| = |a| - |a \wedge b|$$

0.1.5 Cardinality of even/odd natural numbers

What about the cardinality of even numbers? Well, we can define a bijective function between each:

$$f(n) = 2n$$

Similarly for odd numbers:

$$f(n) = 2n + 1$$

So these both have cardinality \aleph_0 .