



## SET NUMBERS AND ARITHMETIC

### Why

How does the number of elements change with unions, and products.

### Results

There are a few nice relations.<sup>1</sup> Recall from *Finite Sets* that the union and product of finite sets is finite. Also, the power of a finite set is finite.

**Proposition 1.** *Let  $A$  and  $B$  be finite sets with  $A \cap B = \emptyset$ . Then  $|A \cup B| = |A| + |B|$ .*

**Proposition 2.** *Let  $A$  and  $B$  be a finite sets Then  $|A \times B| = |A| \cdot |B|$ .*

**Proposition 3.** *Let  $A$  and  $B$  be a finite sets Then  $|A^B| = |A|^{|B|}$ .*

**Proposition 4.** *Let  $A$  be a finite set. Then  $|A^*| = 2^{|A|}$ .*

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<sup>1</sup>Proofs will appear in future editions.



