

## 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  $|\mathcal{P}(A)| = 2^{|A|}$ .

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

