

story.1 Extensionality

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The very first thing to say is that sets are individuated by their **elements**. More precisely:

Axiom (Extensionality). If sets A and B have the same **elements**, then A and B are the same set.

$$\forall A \forall B (\forall x (x \in A \leftrightarrow x \in B) \rightarrow A = B)$$

We assumed this throughout ???. But it bears repeating. The Axiom of Extensionality expresses the basic idea that a set is determined by its **elements**. (So sets might be contrasted with *concepts*, where precisely the same objects might fall under many different concepts.)

Why embrace this principle? Well, it is plausible to say that any denial of Extensionality is a decision to abandon anything which might even be called *set theory*. Set theory is no more nor less than the theory of extensional collections.

The real challenge in ???, though, is to lay down principles which tell us *which sets exist*. And it turns out that the only truly “obvious” answer to this question is provably wrong.

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Bibliography