

## Finite and Infinite Sets

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**Definition 0.1.** Let  $x$  be a set.  $x$  is finite iff  $|x| < \omega$ .

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**Definition 0.2.** Let  $x$  be a set.  $x$  is infinite iff  $x$  is not finite.

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**Proposition 0.3.** Let  $x$  be a set. Then  $x$  is finite iff  $|x| = n$  for some  $n \in \omega$ .

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**Proposition 0.4.** Let  $x$  be a set. Then  $x$  is infinite iff  $|x| \geq \omega$ .

*Proof.*  $|x| \geq \omega$  iff  $|x| \not< \omega$ . □

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**Proposition 0.5.**  $\omega$  is infinite.