

Definition

To prove a family of statements $\forall n \in \mathbb{N}: P(n)$, we can use proof by induction.

Definition: Principle of Mathematical Induction

By proving the *initial case* $P(0)$ and the *induction step* $P(k) \rightarrow P(k+1)$ we conclude $\forall n \in \mathbb{N}: P(n)$. Formally,

$$(P(0) \wedge P(k) \rightarrow P(k+1)) \rightarrow \forall n \in \mathbb{N}: P(n)$$