Principle of Induction

Theorem (Induction)

$$[P(1) \land (\forall k \in \mathbb{N}, P(k) \implies P(k+1))] \implies \forall n \in \mathbb{N}, P(n).$$

- If we want to show $\forall n \in \mathbb{N}, P(n)$;
- First show the base case

• Then show the induction step:

$$\forall k \in \mathbb{N}, P(k) \implies P(k+1).$$