proof by induction


n
n+1
n
n+1

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- use the principle of mathematical induction to show that some result is true for all natural numbers n
- the proof, step by step:
  1. **<u>The base case</u>:** prove that $P(0)$ is true
  2. **<u>Inductive step:</u>** prove that if $P(k)$ is true then $P(k+1)$ is true
  3. Conclude by induction that $P(n)$ is true for all $n \in \mathbb{N}$

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