Induction variants

Sunday, October 18, 2020 7:16 PM

Starting later

→ Simply replace 0 with some $n \in \mathbb{N}$ as base case

→ Note: choose sufficiently large k

Generalizing induction.

→ Can use multiple base cases

→ Can use step size > 1

Strong induction.

Defn. Let P be some predicate. The principle of strong induction states that if

$P(0)$ is true

and

if for any $k \in \mathbb{N}$, if $P(0), P(1), \ldots, P(k)$ are true, then $P(k+1)$ is true

then

for all $n \in \mathbb{N}$, $P(n)$ is true.

Procedure. Same as induction, except assume $P(0), P(1), \ldots P(k)$