Principle of Mathematical Induction

Consider a statement $P(n)$ defined for $\forall n \in \mathbb{N}$. Suppose the following two conditions are true:

(i) $P(1)$ is true

(ii) $\forall k \in \mathbb{N}$ $P(k)$ is true $\Rightarrow P(k+1)$ is true.

Then $P(n)$ is true $\forall n \in \mathbb{N}$

ACTUAL EXECUTION:

Suppose you want to prove a certain statement $P(n)$ is true $\forall n \in \mathbb{N}$, by Math Ind.
YOU CAN PROCEED IN TWO STEPS, AS GIVEN ABOVE:

Step (i) First show $P(n)$ is true for the starting value $n = 1$

Step (ii) Suppose $P(n)$ is true for $n = k$, where k is a fixed, but arbitrary posit. integer
Then, show that $P(n)$ is true for $n = k+1$

Then, by above it follows that $P(n)$ is true $\forall n \in \mathbb{N}$.