

Theorem Prover 6101352.

Let S be given by

Basis: $2 \in S$ and $5 \in S$

Recursive If $x \in S$, then $x+2 \in S$

Show that " $n \in S$ for all $n \geq 4$ "

Proof

Base Cases. $2 \in S \rightarrow 2+2 \in S \rightarrow 4 \in S$
 $5 \in S$

Inductive Hypothesis : Assume $4 \in S, 5 \in S, \dots, (k-1) \in S, k \in S$ are true.

Inductive Step : $k+1 = (k-1)+2$

$(k-1) \in S$ by IH

$(k-1)+2 \in S$ by Recursive definition

$\therefore k+1 \in S$

$\therefore \forall n \in \mathbb{Z}^+; n \in S$ for all $n \geq 4$ is true by Strong Structural Induction