► For a Strong Induction proof, in the <u>Base Step</u> check the <u>least</u> possible number of integer(s) as so to have a correct proof.

## Exercises

**Exercise 1.** A <u>variant</u> of Exercise 4.3.11.

Define the sequence  $\{a_n\}_{n=1}^{\infty}$  recurively by

$$a_1 = 1$$
  
 $a_2 = 5$   
 $a_{n+1} = a_n + 2a_{n-1}$ , if  $n \in \mathbb{N}$ . (1)

Prove that

$$a_n = 2^n + (-1)^n$$

for each  $n \in \mathbb{N}$ .

**Exercise 2.** Prove that every natural number greater than 3 may be written as an integer linear combination of the numbers 2 and 5; that is, if  $m \in \mathbb{N}^{\geq 4}$  then there exists  $x, y \in \mathbb{Z}$  such that m = 2x + 5y.

p209