

4 Homework II

Recall that the Fibonacci numbers $\{f(1), f(2), f(3), \dots\}$ are given by the recursive function

A1. $f(1) = 1$

A2. $f(2) = 1$

B. $f(n+2) = f(n+1) + f(n)$

Z1. Evaluate the first 10 Fibonacci numbers $\{f(1), f(2), f(3), \dots, f(10)\}$.

Z2. Consider the statement

“The n th Fibonacci number is bigger than $2n$.”

Find the smallest Fibonacci number for which it is true.

Z3. Prove, using induction, that the statement in Z2 is true for all $n \geq 10$.

Consider the statement

“Seven to the n th power is one more than three times a counting number.”

W1. Write the statement as a formula using the variable n .

W2. Check the statement for the first two powers of 7, namely $7^1 = 7$ and $7^2 = 7 \times 7$.

W3. Prove, using induction, that the statement is true for all $n \in \mathbb{N}$.