MAT109 FALL 2019: PROBLEM SET 3

Due: Wed. 10/23/2019, by 12:00pm

Directions: You can collaborate, but must write up the solutions independently and in a good handwriting. Consulting solutions to problem sets of previous semesters or internet solutions is not allowed.

Problem 1. Solve Part I: Problem 12-13

Problem 2. Let $u_n$ be the Fibonacci sequence. Prove that $\sum_{i=1}^{n} u_i^2 = u_{n+1} u_n$, for every positive integer $n \geq 1$.

Problem 3. Solve Part I: Problem 16 and Problem 19

Problem 4. Solve Part I: Problem 17

Problem 5. Let $T_n$ be the Tribonacci sequence defined by $T_1 = T_2 = T_3 = 1$ and $T_n = T_{n-1} + T_{n-2} + T_{n-3}$ for every integer $n \geq 4$. Prove that $T_n < 2^n$ for every integer $n \geq 1$. 