

MTH 309

Additional Problem for Section 5.3

(1) Let a_0, a_1, a_2, \dots be the sequence defined recursively by

$$a_n = \begin{cases} 0 & \text{if } n = 0 \\ 8 & \text{if } n = 1 \\ 2a_{n-1} + 3a_{n-2} & \text{if } n \geq 2 \end{cases}$$

Use strong induction to prove $a_n = -2(-1)^n + 2 \cdot 3^n$ for all $n \geq 0$.