

(Rewrite) [+3] Let  $a_0, a_1, a_2, \dots$  be a sequence defined by  $a_0 = 0$  and  $a_n = 2a_{n-1} + 1$  for  $n \geq 1$ . Prove that  $a_n = 2^n - 1$  for all  $n \in \mathbb{N} \cup \{0\}$ .