Homework 1: Induction practice

Due 08/26/16

August 23, 2016

1. Use induction to prove that if a_n is a sequence such that $a_0 = 0$ and $a_n = 2a_{n-1} + 2^n$ for $n > 0$, then $a_n = n2^n$ for all $n \geq 0$.

2. Use strong induction to prove that if b_n is a sequence such that $b_0 = 1$, $b_1 = 6$, and $b_n = 4b_{n-2}$, then $b_n = 2^{n+1} - (-2)^n$ for all $n \geq 0$.

   Hence, $a_n = 2^{n+1} - (-2)^n$ for all $n \geq 0$ by strong induction.