**Math 10A**
**Homework #9; Due Tuesday, 7/24/2018**
**Instructor: Roy Zhao**

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1. Verify that $a_n = 2 \cdot 3^n + 1$ is a solution to the recurrence relation $a_n = 4a_{n-1} - 3a_{n-2}$.
2. Verify that $a_n = 2^n - 1$ is a solution to the recurrence relation $a_n = 2a_{n-1} + 1$ with $a_0 = 0$.
3. Verify that both $a_n = 2^n - 3^n$ and $a_n = 2^n$ are solutions to the recurrence relation $a_n = 5a_{n-1} - 6a_{n-2}$.
4. Find $A, B$ such that $a_n = An + B$ is a solution to the recurrence relation $2a_n = a_{n-1} + 2a_{n-2} + n$.
5. For each of the following recurrence relation, find their order and determine whether they are homogeneous, linear, and/or constant coefficient.
   (a) $a_n = a_{n-1} - a_{n-2}^2$
   (b) $a_n = na_{n-3}$
   (c) $a_n = a_{n-2}^3 - a_{n-4} + 3$
   (d) $a_n = 2a_{n-1} - a_{n-2}$
   (e) $a_n = a_{n-1} + 1$