HOMEWORK #7

Problem 1. Find a closed form solution for
\[ a_0 = 3, \]
\[ a_1 = -3, \]
\[ a_n = 4a_{n-1} - 3a_{n-2} \]

Problem 2. Find the general solution for
\[ a_n = 3a_{n-1} - 5a_{n-2} \]

Problem 3. Suppose
\[ a_n = n2^n + Cn + D \]
for all \( n \), and
\[ a_n = 4a_{n-1} - 4a_{n-2} + 2n - 8 \]
for \( n \geq 2 \). What are \( C \) and \( D \)?

Problem 4. Find a closed form solution for the sequence defined recursively by
\[ a_0 = 7 \] and for \( n \geq 1 \),
\[ a_n = \frac{1}{2}a_{n-1} + 3. \]

Problem 5. Find the general solution to
\[ a_n = 5a_{n-1} - 8a_{n-1} + 4a_{n-1} \]

Problem 6. Number 19 of Section 6.2. Assume you can tell the two dice apart, so a three-four is not the same as a four-three.

Problem 7. How many numbers between 1 and 900,000 (inclusive) are there that are divisible by at least one of the numbers 6, 9 and 15?

Problem 8. Number 4 of Section 6.2.