Honors Seminar Mathematical Modeling
Homework #4
Assigned: 2/11/14 (Tuesday)
Due: 2/18/14 (Tuesday) – in class, written

1) Find a closed form solution to the following recurrence relation using the first method (characteristic equation) shown in class:

$T(1) = -2, T(2) = 2$
$T(n) = 5T(n-1) - 6T(n-2)$, for all $n > 2$

2) Find a closed form solution to the following recurrence relation using the first method (characteristic equation) shown in class:

$T(0) = 5, T(1) = 21$
$T(n) = 6T(n-1) - 9T(n-2)$, for all $n > 1$

3) Find a closed form solution to the following recurrence relation using the first method (characteristic equation) shown in class:

$T(0) = 5, T(1) = 7$
$T(n) = -2T(n-1) - 4T(n-2)$, for all $n > 1$

4) Find a closed form solution to the following recurrence relation using the generating functions method shown in class:

$T(0) = 7, T(1) = 14$
$T(n) = T(n-1) + 12T(n-2)$

5) Determine the number of solutions to the following equation:

$a + b + c + d + e + f = 20$

for integers a, b, c, d, e and f that satisfy the following restrictions:

$a < 5$, $2 < b < 10$, and $d > 3$.

6) Write out a generating function using the information in question 5 so that its coefficient for the term x^{20} equals the answer to question 5. When possible, simplify the generating function to a closed form with relatively few terms.