Assignment 8 – MA 142

Due in class: Wednesday, Dec. 2, 2009

(1) What are the fundamental solutions of the recurrence relation $a_{n+2} = -a_{n+1} + 6a_n$.

(2) What are the fundamental solutions of the recurrence relation $a_{n+2} = a_{n+1} + 2a_n$.

(3) For the recurrence relations in questions (1) and (2), find a formula for the n^{th} term a_n, given the following initial conditions:

   (a) $a_1 = 1, a_2 = 2$.

   (b) $a_1 = 2, a_2 = -1$.

(4) Consider the recurrence relation $a_{n+2} = 4a_n$ with initial conditions $a_1 = 1, a_2 = 6$.

   (a) Find a formula for the n^{th} term a_n.

   (b) What is the 2009^{th} term?

(5) (a) Is 2^{n-1} a fundamental solution of $a_{n+4} = 16a_n$?

   (b) What is the order of the recurrence relation $a_{n+6} = a_{n+1} + a_n$?

   (c) Is 2^{n-1} a fundamental solution of $a_{n+6} = a_{n+1} + a_n$?

(6) Find a formula for the n^{th} term of the sequence defined by $a_1 = 1, a_2 = 2, a_3 = 2$ and $a_{n+3} = 7a_{n+1} + 6a_n$.

(7) Consider the recurrence relation $a_{n+2} = 2a_{n+1} - 2a_n$ with initial conditions $a_1 = 2, a_2 = 5$. Find a formula for a_n.

(8) Consider the recurrence relation $a_{n+2} = -a_n$ with initial conditions $a_1 = 2, a_2 = 2$. Find a formula for a_n.

Section 5.6: 2, 6, 8, 10, 12