CSCE 235 **Fall 2000**

Homework #3 (Due MWednesday, Oct 18, 00)

Question 1: Consider the following sequence:

$$a_n = 4a_{n-1} - 4a_{n-2},\ a_0 = 2,\ a_1 = 8.$$

(a) Solve the above sequence by the "characteristic polynomial method".

(b) Solve the above sequence by the "generating function method".

Question 2: Solve the following sequence:

$$a_n = 4a_{n-1} - 4a_{n-2} + n,\ a_0 = 2,\ a_1 = 8.$$

Question 3: Consider the geometric sequence a_1, a_2, a_3, ..., where $a_1 = \frac{1}{6}$, $a_2 = -\frac{1}{18}$, $a_3 = \frac{1}{54}$, $a_4 = -\frac{1}{162}$, etc.

(a) Does $-\frac{1}{9521}$ belong to the sequence? Explain.

(b) Find the sum of the first 10 elements of the sequence.

(c) Find the limit of: $\sum_{i=1}^{n} a_i$, as $n \longrightarrow \infty$