PMAT 4340 – Combinatorial Analysis   Assignment #8
Fall 2005

Instructions

- Answer each question completely; justify your answers.
- This assignment is due at: 3:00 pm on Monday November 29th.

1. Exercise 7.1.22.

2. Exercise 7.1.34.

3. Exercise 7.2.4.

4. Assuming that n is a power of 2, solve the following recurrence relations:

    (a) $a_n = a_{\frac{n}{2}} + 9$, $a_1 = 3$.

    (b) $a_n = 3a_{\frac{n}{2}} - 4n$, $a_1 = 1$.

    (c) $a_n = 2a_{\frac{n}{2}} + 6n$, $a_1 = 3$.

5. Solve the following linear recurrence relations:

    (a) $a_n = 3a_{n-1} + 4a_{n-2} - 12a_{n-3}$, $a_0 = 7, a_1 = 27, a_2 = 53$.

    (b) $a_n = -4a_{n-1} - 6a_{n-2} - 4a_{n-3} - a_{n-4}$, $a_0 = 1, a_1 = -6, a_2 = 57, a_3 = -196$.

6. Solve the following inhomogeneous recurrence relations:

    (a) $a_n = 2a_{n-1} + n$, $a_0 = 0$.

    (b) $a_n = 3a_{n-1} + 5^n$, $a_0 = 2$.

    (c) $a_n = 4a_{n-1} - n + 3$, $a_0 = 1$.