MATH 4340 – Combinatorial Analysis   Assignment #4
Fall 2013

Instructions

- Answer each question completely; justify your answers.
- This assignment is due at 14:00 on Thursday October 17th in Assignment Box #34.

1. Exercise 5.5.14, parts (e) and (f).

2. Exercise 5.5.22.

3. Find $[x^5]\, G(x)$

   (a) $G(x) = (1 + x + x^2 + x^3)^8$

   (b) $G(x) = (1 + x + x^2 + x^3 + \cdots)^8$

   (c) $G(x) = (1 + x + x^2 + x^3)^8 (1 + x + x^2)^3$

   (d) $G(x) = (x + x^2 + x^3 + x^4 + \cdots)^8 (1 + x + x^2)^3$

4. The city has decided to plant apple trees on its main thoroughfares of First Avenue, Second Avenue, Third Avenue and Fourth Avenue. To add character to the plan, city council has decided that the number of trees that are planted on ith Avenue must be congruent to i modulo 2 (for each i). Let a_r denote the number of ways of planting r trees subject to these criteria.

   (a) Find a generating function for a_r.

   (b) Find a_9.

5. Exercise 6.1.18.