Math 249
Assignment 5

Due: Wednesday, February 16

1. Show that the generating series for compositions of an integer that do not have consecutive even parts is
$$\frac{1-x^2}{1-x-2x^2+x^4}$$
and compute the first five terms of this series using a recurrence.

2. Prove that the number of self-conjugate partitions of n is equal to the number of partitions of n with distinct odd parts, and hence write down their generating series.

3. By computing generating series, show that the number of partitions of an integer where each even part occurs at most once is equal to the number of partitions of an integer where each part occurs at most three times.

4. If $p(n)$ is the number of partitions of the integer n, show that the number of partitions of n where no part has size one is $p(n)-p(n-1)$.