18.314: PROBLEM SET 6 ADDITIONAL PROBLEMS

(A1) Show that the number of partitions of n for which no part appears exactly once is equal to the number of partitions of n for which every part is divisible by 2 or 3. For instance, when $n = 6$ there are four partitions of the first type (namely, $111111, 2211, 222, 33$) and four of the second type $(222, 33, 42, 6)$. Use generating functions.

(A2) Show that the number of partitions of n for which no part appears more than twice is equal to the number of partitions of n for which no part is divisible by 3. For instance, when $n = 5$ there are five partitions of the first type (namely, $5, 41, 32, 311, 221$) and five of the second type $(5, 41, 221, 2111, 11111)$. Use generating functions.