MAC 1103: INTEGER PARTITIONS

1. List and enumerate all compositions of 8 into 3 parts. Next, enumerate the partitions of 8 into 3 parts.
2. Show that the number of partitions of n in which every part is odd is equal to the number of partitions of n with unequal parts.
3. Show that the number of partitions of n in which no integer occurs more than twice as a part is equal to the number of partitions of n into parts not divisible by 3.
4. List all self-conjugate partitions of 15.
5. Show that the number of partitions of n is equal to the number of partitions of $2n$ into exactly n parts.
6. Show that the number of partitions of n with k parts is equal to the number of partitions of n with largest part k.
7. Show that the number of partitions of n into three parts such that the largest is not larger than the sum of the other two is equal to the number of partitions of n into 2s, 3s, and 4s.
8. Show that the number of partitions of $2n + k$ into $n + k$ parts is independent of k.
9. Show that the number of partitions of n in which odd parts are not repeated equals the number of partitions of n in which every part is either odd or a multiple of 4.
10. Show that the number of partitions of n with k parts and largest part m is equal to the number of partitions of $n - k$ with $m - 1$ parts, none of which is greater than k.