NUMBER THEORY: CLASS 23

1. Exercise

1) Show explicitly the bijection match using conjugation of
$p(n|m \text{ parts}) = p(n| \text{ greatest part is } m)$
for $n = 8$ and $m = 4$.

2) Prove $p(n| \leq m \text{ parts}) = p(n| \text{ all parts} \leq m)$.

The following two problems are refinement of Euler's Theorem.

3) Let $N = \{1\}$. Find the set M such that

$p(n| \text{ parts in } N) = p(n| \text{ distinct parts in } M)$ for all $n \geq 1$.

4) Let $N = \{1, 3\}$. Find the set M such that

$p(n| \text{ parts in } N) = p(n| \text{ distinct parts in } M)$ for all $n \geq 1$.

5) A partition function $p(n)$ also have a nice relation between their values and congruence.

Use command in the Maple program to conjecture the relation between the values of $p(5n+4)$, $p(7n+5)$ and $p(11n+6)$ and theirs congruence.

Try:
$> with(combinat);$
$> seq(numbpart(5 * n + 4), n = 1..10);$

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