NUMBER THEORY: HOMEWORK 8

Homework due on Tuesday November 25.

1. Problems

1) Show explicitly the bijection match between $p(n|$ odd parts) and $p(n|$ distinct parts) for every n between 1 and 10.
a) Using merging-splitting procedure we discussed in class.
b) Using Sylvester's algorithm.

2) Show that $p(n|$ distinct parts and each part $\equiv \pm 1 \bmod 3) = p(n|$ parts are $\pm 1 \bmod 6)$.
(Hint: use generating function).

3) a) Find a closed form formula of $p(n|$ at most 2 parts).
b) Find a closed form formula of $p(n|$ parts in $\{1, 2\})$.

4) Find the set A such that

$p(n|$ no part appears more than twice) $= p(n|$ parts in $A)$
for all $n \geq 1$.

5) In the 27-letter alphabet (with blank = 26), use the affine enciphering transformation with key $a = 13$, $b = 9$ to encipher the message "HELP ME".

Date: Tuesday, November 18, 2008.