Math 239 Tutorial 5

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June 4th, 2015

Q1

S is triples $(a_1, a_2, a_3) \in N \times N \times N^n$
sth, $a_1 < a_2 < a_3$
$w(a_1, a_2, a_3) = a_1, a_2, a_3$

$2,4,7 \to 2,2,3$ f: $S \to N \times N \times N$
$a_1, a_2, a_3 \to a_1, a_2 - a_1, a_3 - a_2$
g : $N \times N \times N \to S$
$b_1, b_2, b_3 \to b_1, b_1 + b_2, b_1 + b_2 + b_3$

$a_1, a_2, a_3 \to a_1, a_2 - a_1, a_3 - a_2$
$\to a_1, a_2, a_3$

$w^*(b_1, b_2, b_3) = 3b_1, 2b_2, b_3$
$w(a_1, a_2, a_3) = w^*(F(a_1, a_2, a_3))$
$a_1 + a_2 + a_3 = w^*(a_1, a_2 - a_1, a_3 - a_2)$
$= 3a_1 + 2(a_2 - a_1) + (a_3 - a_1)$
$= a_1 + a_2 + a_3$

$N \times N \times N \sum_{n \in N} (x)^{w_2(n)} = (x + x^2 + x^3 + ..)(x^2 + x^3 + x^4 + ...)(x^3 + x^4 + x^5 + ...)$
$= \frac{x}{(1-x)} \frac{x^2}{1-x^2} \frac{x^3}{(1-x^3)}$