1023-05-435 **Steve Butler*** (`sbutler@math.ucsd.edu`), Department of Mathematics, University of California, San Diego, La Jolla, CA 92093-0112. *The Moebius transform of the triangular numbers.*

We give an interpretation for the Moebius transform of the triangular numbers. In particular we will show that if $\mu(n)$ is the Moebius function and T_n is the nth triangular number,

$$|\{(x,y) : 1 \le x \le y \le n, \ \gcd(x,y,n) = 1\}| = \sum_{d|n} \mu(n/d) T_d.$$

This can be generalized to higher dimensions, and as a simple application we will show that

$$|\{(a_1,\dots,a_k) : 1 \le a_1 \le \cdots \le a_k \le n, \ \gcd(a_1,\dots,a_k) = 1\}| = \sum_{i \ge 1} M(\lfloor n/i \rfloor) \binom{i+k-2}{k-1},$$

where $M(n)$ is Mertens function with the convention that $M(0) = 0$. (Received September 12, 2006)

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