1093-11-206 **Eva G Goedhart*** (egoedhart@brynmawr.edu) and **Helen G Grundman**. *The complete solution of* $NX^2 + 2^L 3^M = Y^N$.

Let $N > 1$ be an integer and consider the Diophantine equation

$$NX^2 + 2^L 3^M = Y^N.$$

We have proven that this equation has no solutions with $L, M, X, Y \in \mathbb{Z}^+$ and $\gcd(NX, Y) = 1$. Our proof incorporates a variety of standard methods including the use of defective Lehmer pairs and class number arguments.

In this talk, I will discuss these methods along with earlier results, then present our proof. (Received August 14, 2013)