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Department of Mathematics

## PROBLEM OF THE MONTH

**Term:** January 2009

Let  $f : \mathbb{Z}^+ \times \mathbb{Z} \rightarrow \mathbb{Z}$  be a function satisfying the following conditions:

1.  $f(0, k) = 1$  if  $k = 0, 1$ .
2.  $f(0, k) = 0$  if  $k \neq 0$  and  $k \neq 1$ .
3.  $f(n, k) = f(n - 1, k) + f(n - 1, k - 2n)$  for all  $n \geq 1$  and  $k$ .

Determine  $\sum_{k=0}^{\binom{2009}{2}} f(2008, k)$ .