

# Philadelphia Area Number Theory Seminar

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## The Cancellling Game

**Abstract:** An  $n$ -tuple of integers  $(a_1, \dots, a_n)$  is called *multiplicatively dependent*, if it allows you to win the “Cancellling Game”, i.e. if there exist integers  $k_1, \dots, k_n \in \mathbb{Z}$ , not all zero, such that

$$a_1^{k_1} \cdots a_n^{k_n} = 1.$$

After an unconventional introduction, we will ask many questions related to consecutive tuples of multiplicatively dependent integers, and answer some of them. For example, do there exist integers  $1 < a < b$  such that  $(a, b)$  and  $(a + 1, b + 1)$  are both multiplicatively dependent? It turns out that this question is easily answered, and after briefly discussing some more general properties of pairs, we will move on to triples. The proof of the main result relies on lower bounds for linear forms in logarithms. This talk is based on joint work with Volker Ziegler, as well as some work in progress.

**Wednesday, February 15, 2023**  
**3–5 PM**

Bryn Mawr College  
Department of Mathematics  
Park Science Center **328**

Informal refreshments at 3PM – Talk at 3:30PM