Time limit: 15 minutes.
Instructions: This tiebreaker contains 3 short answer questions. You will submit answers to the problem as you solve them, and may solve problems in any order. You will not be informed whether your answer is correct until the end of the tiebreaker. You may submit multiple times for any of the problems, but **only the last submission for a given problem will be graded**. The participant who correctly answers the most problems wins the tiebreaker, with ties broken by the time of the last correct submission.
No calculators.

1. How many integers n from 1 to 2020, inclusive, are there such that 2020 divides $n^2 + 1$?

2. A *gradian* is a unit of measurement of angles much like degrees, except that there are 100 gradians in a right angle. Suppose that the number of gradians in an interior angle of a regular polygon with m sides equals the number of degrees in an interior angle of a regular polygon with n sides. Compute the number of possible distinct ordered pairs (m, n).

3. Let N be the number of tuples $(a_1, a_2, \ldots, a_{150})$ satisfying:

   - $a_i \in \{2, 3, 5, 7, 11\}$ for all $1 \leq i \leq 99$.
   - $a_i \in \{2, 4, 6, 8\}$ for all $100 \leq i \leq 150$.
   - $\sum_{i=1}^{150} a_i$ is divisible by 8.

   Compute the last three digits of N.