Time limit: 15 minutes.
Instructions: This tiebreaker contains 3 short answer questions. All answers must be expressed in simplest form unless specified otherwise. 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. A certain elementary school has 48 students in the third grade that must be organized into three classes of 16 students each. There are three troublemakers in the grade. If the students are assigned independently and randomly to classes, what is the probability that all three troublemakers are assigned to the same 16 student class?

2. A 4-digit number x has the property that the expected value of the integer obtained from switching any two digits in x is 4625. Given that the sum of the digits of x is 20, compute x.

3. Let S be the set of factors of 10^5. The number of subsets of S with a least common multiple of 10^5 can be written as $2^n * m$, where n and m are positive integers and m is not divisible by 2. Compute $m + n$.