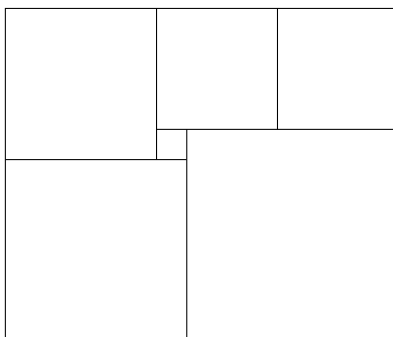# BRITISH COLUMBIA SECONDARY SCHOOL MATHEMATICS CONTEST, 2025

Junior Final, Part B

May 2, 2025

1. For some integers x and y, the number $3x + 2y$ is divisible by 23. Prove that the number $17x + 19y$ is also divisible by 23.

2. The diagram shown is a rectangle that has been divided into 6 squares. If the smallest square has sides of length 1, what are the lengths of the sides of the rectangle?

3. A highly composite number is a positive integer that has more divisors than any smaller positive integer. For example, 6 is a highly composite number because it has more divisors than 1,2,3,4 or 5. How many highly composite numbers are there between 10 and 50?

4. The number 321321321321 is written on a blackboard. What digits should be erased to obtain the largest number divisible by 9?

5. A clock has an hour hand of length 2 and a minute hand of length 4. From 3:00 am to 3:00 pm of the same day, find the number of occurrences when the distance between the tips of the two hands is an integer.