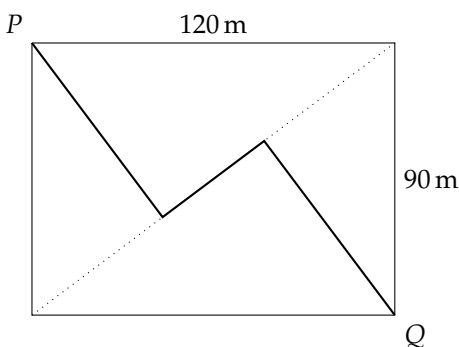


BRITISH COLUMBIA SECONDARY SCHOOL MATHEMATICS CONTEST, 2026

Junior Final, Part B

May 1, 2026

1. Find all triples of primes a, b and c such that $7a - bc = 105$.
2. Anne of Green Gables is at the corner entrance of the “Park of the Lake of Shining Waters.” Starting at point P , she needs to reach point Q as quickly as possible. If she walks along the sides of the park, she walks a total distance of 210 metres. If she walks through the park, she must follow the zigzag path with two right-angled turns as shown. Is this zigzag path shorter than 210 metres?



3. You have 100 large jugs, each with a capacity of 10 Litres. For each integer $n = 1, \dots, 100$, there is a jug that contains exactly n mL of water. You are allowed to redistribute the water among the jugs by pouring water from one jug into another as many times as you like subject to the rule that, at each step in the process, the amount of water poured into a jug must equal the amount that is in the jug already (so that the effect of the added water is to double the amount of water in the jug).
 - a) Is it possible to redistribute the water so that, for each $n = 1, \dots, 100$, there is a jug that contains exactly n mL of water, but no jug contains the same amount of water as it did initially? Explain.
 - b) Is it possible to redistribute the water so that five of the jugs each contain exactly 3 mL of water and, for each $n = 6, 7, \dots, 100$, there is a jug that contains exactly n mL of water? Explain.
4. Lewis and Carol travel together on a road from A to B, then return on the same road, with the entire trip taking 3 hours. Sometimes the road goes uphill, sometimes it goes downhill, and sometimes it is level. When the road goes uphill their rate is 40 kph; when it goes downhill their rate is 60 kph; on level road their rate is x kph.

Even if you were given a numerical value for x , the distance from A to B would (in most cases) not be uniquely determined. But there is one value for x that would determine that distance uniquely. What is this value? Note: Uphill is going downhill returning!
5. Let us call a positive integer “nice” if it can be expressed as the sum of a three-digit number abc and a three-digit number cba , where the symbols a, b and c represent digits and the digits a and c are not zero. How many positive integers are nice?