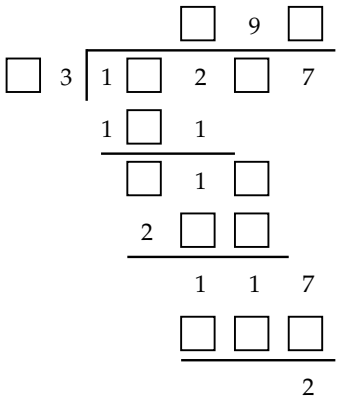
BRITISH COLUMBIA SECONDARY SCHOOL MATHEMATICS CONTEST, 2009

Junior Final, Part B

Friday May 8

Dedicated to the memory of Jim Totten, the inspiration for and co-founder of the BCSSMC

1. (a) Place any of the digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 in each of the boxes to correctly complete the long division below. Some digits may appear once, others may appear more than once, and some may not appear at all. (This problem may be done directly on the question sheet and full marks will be given for a correct answer. Explanation of your work is optional and will be graded only if there are any errors in the answer.)



(b) List the positive integers n for which $\dfrac{420}{3n+1}$ is an integer.

2. The floor in a rectangular room in Hernando's house has 20 square tiles along its width and 45 square tiles along its length. Hernando draws a diagonal from one corner of the room to the opposite corner. How many tiles does the diagonal cross?

3. Children have been bringing cookies for a school cookie sale, and your class is keeping track of the offerings. They find that $\frac{3}{10}$ of the cookies contain (among other things) oatmeal, $\frac{1}{2}$ of them have (among other things) chocolate chips, and $\frac{3}{28}$ of them have both oatmeal and chocolate chips. If 172 of the cookies have neither oatmeal nor chocolate chips, determine the total number of cookies offered.

4. How many three digit whole numbers have digits that when multiplied together give a product that is greater than 60 and less than 65?

5. An isosceles right triangle ABC with legs of length 2 cm is cut from a sheet of paper that is cross-hatched on one side and is solid gray on the other. The triangle is folded by moving the vertex C to position C' on side BC. If the cross-hatched area and the solid gray area are equal, determine the distance between B and C'.