

University of Washington Math Hour Open Olympiad, 2011

Grades 8-9

Additional Problems

6. A red square is placed on a table. 2010 white squares, each the same size as the red square, are then placed on the table in such a way that the red square is fully covered and the sides of every white square are parallel to the sides of the red square. Is it always possible to remove one of the white squares so the red square remains completely covered?
7. A computer starts with a given positive integer to which it randomly adds either 54 or 77 every second and prints the resulting sum after each addition. For example, if the computer is given the number 1, then a possible output could be: 1, 55, 109, 186, ... Show that after finitely many seconds the computer will print a number whose last two digits are the same.