UW Math Circle

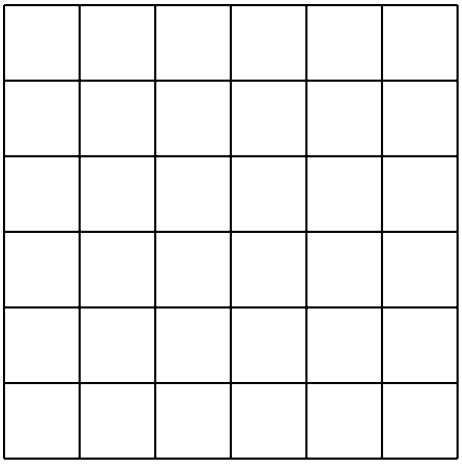
November 5, 2015

1. Take a chessboard, and remove two opposite corner squares. Can the resulting board be covered by (non-overlapping) 2×1 dominoes?

2. A magic square is a square array of boxes with a different number in each box, so that the sum of the numbers in each row, column, and diagonal of the box are the same.

   Is it possible to make a magic square out of the first 36 prime numbers?



3. A knight begins in the lower left hand corner of a chessboard. Can it travel to the upper right hand corner of the chessboard, hitting every square of the chessboard exactly once in the process?

4. Can you arrange the numbers 1 through 9 in a sequence so that there is an odd number of numbers between 1 and 2, 2 and 3, ..., 8 and 9?

5. (a) Show that every magic square made of the numbers 1 through 9 has the same number in its middle square.

   (b) How many magic squares are there made of the numbers 1 through 9?