UW Math Circle
January 22, 2015
Homework

1. Can a 5×5 checkerboard be covered by 1×2 dominoes?

2. You walk into a room and find three boxes sitting on a table. Each box contains some number of coins, and you can see how many coins are in each box. In the corner of the room, there is a large pile of coins. You can take two coins at a time from the pile and place them in different boxes. If you can add coins to boxes in this way as many times as you like, can you guarantee that each box on the table will eventually contain the same number of coins?

3. Prove there is an integer consisting only of 1's (something like 11111...) that is divisible by 7373.

4. A 10×10 table is filled in with positive integers so that adjacent integers *(integers are adjacent if their squares share a side)* differ by 5 or less. Show that the table must contain two identical integers.