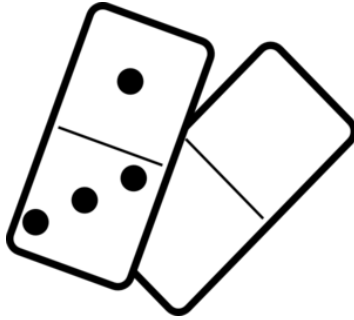


UW Math Circle  
October 6th, 2016  
Homework



1. Can a  $5 \times 5$  chessboard be covered by  $1 \times 2$  dominoes?
2. Can you fill a  $4 \times 4$  grid with whole numbers so that the sum of numbers in each row is odd, and the product of numbers in each column is odd?
3. Remember that a domino is a  $1 \times 2$  rectangle where on each square there are between 0 and 6 dots, and a set of dominoes is a collection of dominoes where there is one representative from each of the possible pairs of dots. Can a set of dominoes be arranged in a row, where the number of dots on touching ends matches?  
Now, you remove all the dominoes that have at least one square with no dots from your set. Can the dominoes that are left be arranged in a row, where the number of dots on touching ends matches?
4. How many four digit numbers are there that begin with 1 and have exactly two identical digits? (Examples of such numbers are 1800, 1231, 1447.) What if the number doesn't have to begin with 1?