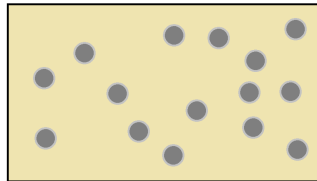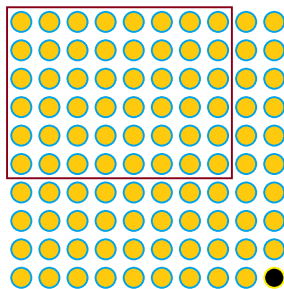# UW Math Circle
May 16, 2013
Homework

1. Benjamin and Daniel are playing a game on a rectangular desk during their boring math class. On his turn, each of them must place a dime somewhere on the table. (The dimes are not permitted to overlap.) The player who cannot place a dime loses. Daniel goes first. What is the winning strategy, and who has it?



2. Two girls are playing a game. There are three piles of stones with 10, 15, and 20 stones. On her turn, each player chooses any pile with more than one stone and splits it into two smaller piles. The player who can't make a move loses. What is the winning strategy, and who has it?

3. While walking through the desert you meet a sphinx who offers to play a game. He places 100 pieces of candy in a square like this:



   On your turn, you can take any piece of candy, as well as all the ones above and to the left of it. (For example, you could take all the ones outlined in brown.) The bottom right candy is poisoned: if you eat it, you will die. You go first. Can you survive?

4. The game of Double Chess is played just like chess, but with a twist. On his or her turn, each player can make two regular chess moves. Prove that Black does not have a winning strategy in Double Chess.