

Name:

Math/CCS 103

Professor: Padraic Bartlett

Quiz 9: Presentations (extra credit!)

Due Wednesday at noon, finals week

UCSB 2014

Pick any four of the problems below to solve!

1. (Kayla) Draw a configuration in the game of life that dies out after 3 steps, but not after 2 steps. (I.e. create a set of cells that start alive so that after 3 turns, everything is dead, but after 1 or 2 turns there are still living cells.)
2. (Declan) Describe a way of dividing a cake for four people that is not envy-free. Explain why.
3. (Ziming) Find the smallest positive number that is $4 \pmod{5}$, $3 \pmod{8}$, and $2 \pmod{11}$.
4. (Landon) Find a minimal critical set in a 4×4 Latin square.
5. (Nick) Show that the line $y = x$ has zero curvature.
6. (Jay) Create two different knots that are not the unknot. Explain why they are not the unknot or equal to each other.
7. (Tianruo) Write down the surreal number that corresponds to $1/3$.
8. (Alice) Create three games A, B, C such that if you play any one of them repeatedly, you will lose money in the long run, but if you play them in the order $A \rightarrow B \rightarrow C \rightarrow A \rightarrow B \rightarrow C \rightarrow A \rightarrow B \rightarrow C \dots$, you will gain money in the long run.