UW Math Circle
October 3, 2013
Homework: Week 2

1. Can you take $1 \_\_ 2 \_\_ 3 \_\_ 4 \_\_ 5 \_\_ 6 \_\_ 7 \_\_ 8 \_\_ 9 = 0$ and insert a $+$ or $-$ in each blank to get a true statement?

2. Is it possible to fill a 4×4 square with integers so that the sum of the numbers in each row is odd and the product of the numbers in each column is odd?

3. If a knight starts at one corner of a chessboard, it is possible for the knight to get to the opposite corner of the chessboard stopping on each square exactly once?

4. There's been a zombie apocalypse and only you know the cure for turning zombies back into their human form: a careful combination of sulfuric acid, grape juice, and water. Most of your lab equipment has been destroyed by the zombies, but you have a 1 oz vial of sulfuric acid, a 2 oz vial of grape juice, and a 3 oz vial of water. You also have one empty 1 oz, 2 oz, and 3 oz vial. With no other equipment, can you fill the empty vials with a mixture of acid, grape juice, and water so that each vial contains the same ratio of acid to grape juice to water?