Homework Week 11

1. Find all the numbers between 101 and 150 that have primitive roots.
2. Use Gauss’s Lemma to see if 5 is a quadratic residue modulo 19.
3. Use Gauss’s Lemma to see if 5 is a quadratic residue modulo 37.
4. Find all solutions to
5. Find all solutions to
6. Find the number of 3-shuffles needed to get a deck of 21 cards back to its original configuration.
7. Find the number of 3-shuffles needed to get a deck of 21 cards labeled 0,1,2,3,4,5,0,1,2,… back to its original configuration.
8. Find the number of 3-shuffles needed to get a deck of 141 cards labeled 0,1,2,3,4,5,6,7,8,9,0,1,2,… back to its original configuration.

1 is 10 pts, rest are 5 pts.