Math 420 Section 1

Midterm Exam

1. Solve the congruence $x734 \equiv 3 \mod 793$.

2. Write out the composition table for S_3.

3. a) State the definition of equivalence relation.

   b) For two 2×2 matrices A and B, say $A \sim B$ if there is some invertible 2×2 matrix C such that $A = CBC^{-1}$. Is this an equivalence relation? (Completely state your reasoning.)

4. a) State the definition of congruence modulo m.

   b) How many congruence classes are in $\mathbb{Z}_{40}^{\times}$?

5. State Euclid's Lemma.