HOMEWORK 2

1. There are 3 kinds of elementary matrices. What happens with a matrix A if we multiply it from the right by one of these elementary matrices?

2. Define the column echelon matrix, and show that every matrix A has a column echelon form (i.e there are elementary matrices E_1, E_2, ... ,E_n, so that $AE_1E_2E_3...E_n$ is a column echelon matrix).

3. Prove that the following statements are equivalent for a square matrix A.

   - A can be reduced to the identity matrix using column reduction.
   - A is the product of elementary matrices.
   - A is invertible.
   - $XA = 0$ has a unique solution.

4. 3.1, 3.4.

5. 4.1, 4.2, 4.3 (calculate $n = 2$, $n = 3$ first), 4.4, 4.6.