Homework # 1- Due Tuesday January 17

Assigned Tuesday January 10:

(1) Read Chapter 1

(2) Chapter 1, exercises 4, 5, 9, 10, 11

(3) Let

$$r = \begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}, s = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}.$$

Let D be the set of eight matrices $\{r, r^2, r^3, r^4, s, sr, sr^2, sr^3\}$. Calculate the eight matrices in D. Check that the set D is closed under multiplication by writing down the multiplication table. Verify group properties (ii) and (iii). Does D have any elements which are their own inverse? Is multiplication on D commutative?

(4) Vocabulary: solvable by radicals, binary operation, closure, group, associative, commutative, identity, inverse, order of a group