Math 103A Fall 2005 Homework 2

Due 10/10/05 in class

All exercise and page numbers refer to Gallian, 6th edition.

0. These exercises are suggestions for extra practice at home (or in section) and are not to be turned in!
   Gallian Section 1, #5, 7, 11, 13
   Gallian Section 2, #5, 8, 9, 13, 15, 17, 19, 33
   Gallian Section 3, #1, 7, 13, 23, 35, 39, 48, 49

1. Do Gallian Section 1, #6, 8, 14.
   Comments:
   for #6 and #8, ignore the word "geometrically" and use any valid argument you can come up with; it might be geometric or it might be algebraic.

2. Do Gallian Section 2, #12, 14, 20, 24, 26, 34.
   Comments:
   for #34, you can assume without proof that multiplication of 3 by 3 matrices is associative.

3. Let $G = \mathbb{Q} \setminus \{0\}$ be the set of all nonzero rational numbers. Define a binary operation $\ast$ on $G$ by the rule $a \ast b = 3 \cdot a \cdot b$. The $\cdot$ symbol here indicates ordinary multiplication of rational numbers. Prove that this operation makes $G$ into a group.

4. Do Gallian Section 3, #6, 14, 44.
   Comments:
   In #44, "a power of 2" means any number of the form $2^n$ where $n \in \mathbb{Z}$. 