**Homework 6**
due February 20, 2002 in class

(1) Artin 5.4.12 (pg. 190)
(2) Artin 5.7.2 (pg. 194)
(3) Artin 5.9.3 (pg. 195)
(4) Artin 5.9.4 (pg. 195)
(5) Show that if $A \in \mathrm{SO}_3(\mathbb{R})$ and $x \in S^2$, then $Ax \in S^2$. Conclude that $S^2$ is an $\mathrm{SO}_3(\mathbb{R})$-set under the action $(A, x) \mapsto Ax$.
(6) Show that if $G$ is a finite subgroup of $\mathrm{SO}_3(\mathbb{R})$, then the number of poles of $G$ is finite.
(7) Artin 7.1.2 (pg. 263)