

18.703 HOMEWORK #4, DUE THURSDAY MARCH 14TH

1. Herstein, Chapter 2, §5, 1.
2. Show that $H = \{ I, R, R^2, R^3 \}$ is a normal subgroup of the dihedral group D_4 .
3. Herstein, Chapter 2, §5, 12.
4. Herstein, Chapter 2, §5, 17.
5. Let $G = S_3$ and $H = \{ e, (1, 2) \}$.
 - (i) Write down all the left cosets of H in G .
 - (ii) Write down all the right cosets of H in G .
 - (iii) Is every left coset of H a right coset of H ?
6. Herstein, Chapter 2, §5, 26.
7. Herstein, Chapter 2, §5, 27.
8. Herstein, Chapter 2, §5, 37.
9. Herstein, Chapter 2, §5, 43.
10. Herstein, Chapter 2, §5, 49.
11. **Challenge Problem:** Herstein, Chapter 2, §5, 52.