Fourth Homework
Due 10:10 a.m., Wednesday February 20

1. Exercise 2.14 on page 30. (5 points)

2. Compute the character table of the symmetric group $S_5$. Use this to compute the character table of the alternating group $A_5$. You may assume that $A_5$ has 5 conjugacy classes with representatives (1), (123), (12)(34), (12345), (12354).

You may also assume the following. The normalizer of a Sylow 5-subgroup in $S_5$ has index 6. By considering the permutation representation on the six left cosets, a character (not irreducible) $\chi$ of $S_5$ is obtained with $\chi(1) = 6$, $\chi(12) = 0$, $\chi(123) = 0$, $\chi(1234) = 2$, $\chi(12345) = 1$, $\chi(12)(34) = 2$, $\chi(12)(345) = 0$. (12 points)

(2 problems, 17 points altogether)