Modern Algebra 1
Spring 2010

Homework 11.2
Due April 14

Exercise 4. Determine if the permutations in Exercise 1 are even or odd.

Exercise 5. Prove that a cycle in S_n is even if and only if its length is odd.

Exercise 6. Let $f(x_1, x_2, \ldots, x_n)$ be a function of n variables ($n \geq 2$).

a. Prove that $H_f = \{\sigma \in S_n \,|\, \sigma f = f\}$ is a subgroup of S_n.

b. If $f(x_1, x_2, x_3, x_4) = x_1 + x_2 + x_3 x_4$ show that $H_f \cong \mathbb{Z}_2 \times \mathbb{Z}_2$

c. Find a polynomial $f(x_1, x_2, x_3, x_4)$ so that $H_f = \langle (1234), (13) \rangle$.