

**Problem Set 4**

**Directions:** Work all of the following problems.

1. Write each of the following permutations as the product of disjoint cycles.

a.  $(1235)(413)$

b.  $(13256)(23)(46512)$

c.  $(12)(13)(23)(142)$

2. Find the order of  $(124)(357869)$

3. What is the order of  $\begin{bmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 2 & 1 & 5 & 4 & 6 & 3 \end{bmatrix}$

4. Find the inverse of:

a.  $\begin{bmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 2 & 1 & 5 & 4 & 6 & 3 \end{bmatrix}$

b.  $(213546)$

c.  $(a_1 a_2 a_3 \dots a_n)$

5. Show that a function from a finite set  $S$  onto itself is one-to-one if and only if it is onto. Is this true if  $S$  were infinite?