

Group Reps Homework 4-15

1. Consider the permutation group on 3 elements $\{1, 2, 3\}$.
[see page 4]

A. The group has a representation as permutation matrices;
find the character of all group elements.

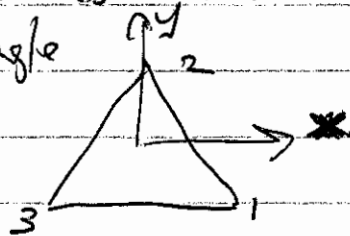
[A "permutation matrix" is a matrix of 1's & 0's
that emulates the permutation. For example,

for the permutation

1	→	4
2	→	1
3	→	3
4	→	2

the p.m. is $\begin{pmatrix} 0 & 0 & 0 & 1 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$.

B. The group also has a representation as rotations
& reflections of a labeled triangle
in 2-space.



Find the character of all
group elements

C. The map $\sigma \rightarrow \text{parity of } \sigma$ is a 1-d rep.
Find its character on all group elements