Math 546 sp 2001 EX3

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PRINT Your Name:_____

There are 9 problems on 5 pages. Problem 1 is worth 12 points. Each of the other problems is worth 11 points.

1. Let $\sigma = (1,2,3)(4,5,6)$ and $\tau = (3,4,5)$ be elements of S_6. Write $\tau\sigma\tau^{-1}$ as the product of disjoint cycles.

$\tau\sigma\tau^{-1} = (345)(123)(456)(354) = (124)(365)$

2. Is the group $(\mathbb{Z}_{12}^{\times}, \times)$ a cyclic group? Why or why not?

The elements of $\mathbb{Z}_{12}^{\times}$ are $[1], [5], [7], [11]$. Each element of $\mathbb{Z}_{12}^{\times}$ squares to $[1]$, because $[5]\cdot[5] = [25] = [1]$, $[7]\cdot[7] = [49] = [1]$ and $[11]\cdot[11] = [121] = [1]$. Thus this group is not cyclic