

GROUP THEORY

The integers $1, 2, \dots, n$ are arranged in order. In one step you may take any four integers and exchange the first with the fourth and the second with the third. Prove that, if $\frac{n(n-1)}{2}$ is even then, by means of such steps you may reach the arrangement $n, n-1, \dots, 2, 1$. However, if $\frac{n(n-1)}{2}$ is odd then you cannot reach this arrangement.