

1. Suppose that $\sigma = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 2 & 1 & 4 & 3 \end{pmatrix}$ in S_n . Find

a. the integer n such that $\sigma^n(a) = a \quad \forall a \in Z$.

b. the inverse of σ .

c. the number of elements of S_n .

2. a. Prove that $*$ is binary operation on the set of integers where $a * b = a - b$.

b. Is the operation in part a is binary operation on the set of natural numbers? Way ?