

NAME: _____

STUDENT ID: _____

Let

$$\alpha = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 3 & 1 & 5 & 6 & 2 & 4 \end{pmatrix} \quad \text{and} \quad \beta = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 2 & 4 & 3 & 1 & 6 & 5 \end{pmatrix}$$

be permutations in S_6 .

- (a) Write α and β in disjoint cycle notation.
- (b) Compute $\alpha\beta$ and express the result in disjoint cycle notation.
- (c) Find α^{-1} in disjoint cycle notation.
- (d) Determine the order of α and β , and their parity. Justify your answer.
- (f) List *all* possible orders of elements of S_6 . Justify by giving an element of each order.