

## MTH 4441 - Test 2

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Name \_\_\_\_\_

Show CLEARLY how you arrive at your answers.

In Exercises 1-4, compute the “product” of the permutations.

$$\sigma = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 6 & 5 & 4 & 3 & 2 & 1 \end{pmatrix}; \quad \tau = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 2 & 1 & 4 & 3 & 6 & 5 \end{pmatrix}; \quad \mu = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 5 & 6 & 4 & 3 & 1 & 2 \end{pmatrix}$$

1.  $\tau\mu =$

2.  $\sigma\tau =$

**Recall:**

$$\sigma = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 6 & 5 & 4 & 3 & 2 & 1 \end{pmatrix}; \quad \tau = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 2 & 1 & 4 & 3 & 6 & 5 \end{pmatrix}; \quad \mu = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 5 & 6 & 4 & 3 & 1 & 2 \end{pmatrix}$$

3.  $\mu^{-1} =$

4.  $\mu^{-1}\sigma =$

In Exercises 5-6, decompose the given permutations into the “product” of disjoint cycles.

$$5. \pi = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 \\ 7 & 4 & 6 & 5 & 8 & 3 & 1 & 2 \end{pmatrix}$$

$$6. \theta = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 \\ 4 & 1 & 6 & 2 & 7 & 5 & 8 & 3 \end{pmatrix}$$

In Exercises 7-8, decompose the given permutations into the “product” of transpositions.

$$7. \pi = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 \\ 7 & 4 & 6 & 5 & 8 & 3 & 1 & 2 \end{pmatrix}$$

$$8. \theta = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 \\ 4 & 1 & 6 & 2 & 7 & 5 & 8 & 3 \end{pmatrix}$$