Assignment 1

The problem involves analyzing the given assignment. Ask your mentor questions if you are not clear on any details of the assignment.

1. A subset $A$ of a permutation $\sigma = \sigma_1 \sigma_2 \cdots \sigma_n$ is a transposition if it contains only two elements, so $\sigma$ contains $\sigma_2$ and $\sigma_3$. How many permutations of $\sigma$ contain a transposition? (Answer: 2)

2. If $\sigma = (2, 3, 1)$, what is the inverse of the permutation $\sigma$?

3. A transposition $\tau$ is a permutation that swaps two elements. How many transpositions are there in $\sigma$?

4. Show that if $\sigma$ is a permutation of $\{1, 2, 3, 4, 5\}$, then $\sigma$ contains at least one transposition.

5. What is the number of transpositions in $\sigma$?

6. Let $\sigma$ be a permutation of $\{1, 2, 3, 4, 5\}$. Show that $\sigma$ contains at least one transposition.

7. If $\sigma = (2, 3, 1)$, what is the inverse of $\sigma$?

8. If $\sigma$ is a permutation of $\{1, 2, 3, 4, 5\}$, show that $\sigma$ contains at least one transposition.

9. If $\sigma$ is a permutation of $\{1, 2, 3, 4, 5\}$, show that $\sigma$ contains at least one transposition.

10. If $\sigma$ is a permutation of $\{1, 2, 3, 4, 5\}$, show that $\sigma$ contains at least one transposition.

11. If $\sigma$ is a permutation of $\{1, 2, 3, 4, 5\}$, show that $\sigma$ contains at least one transposition.

12. If $\sigma$ is a permutation of $\{1, 2, 3, 4, 5\}$, show that $\sigma$ contains at least one transposition.

13. If $\sigma$ is a permutation of $\{1, 2, 3, 4, 5\}$, show that $\sigma$ contains at least one transposition.

14. If $\sigma$ is a permutation of $\{1, 2, 3, 4, 5\}$, show that $\sigma$ contains at least one transposition.

15. If $\sigma$ is a permutation of $\{1, 2, 3, 4, 5\}$, show that $\sigma$ contains at least one transposition.

16. If $\sigma$ is a permutation of $\{1, 2, 3, 4, 5\}$, show that $\sigma$ contains at least one transposition.

17. If $\sigma$ is a permutation of $\{1, 2, 3, 4, 5\}$, show that $\sigma$ contains at least one transposition.

18. If $\sigma$ is a permutation of $\{1, 2, 3, 4, 5\}$, show that $\sigma$ contains at least one transposition.

19. If $\sigma$ is a permutation of $\{1, 2, 3, 4, 5\}$, show that $\sigma$ contains at least one transposition.

20. If $\sigma$ is a permutation of $\{1, 2, 3, 4, 5\}$, show that $\sigma$ contains at least one transposition.