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INPTU

HW 15

- (1) $S_{1,2,3}$
 $= S_{1,2,3} = 0$ inversions
 $S_{1,3,2} \rightarrow 1$ inversion
 $S_{2,3,1} \rightarrow 1$ inversion
 $S_{2,1,3} \rightarrow 1$ inversion
 $S_{3,1,2} \rightarrow 2$ inversions
 $S_{3,2,1} \rightarrow 2$ inversions
- (2) 1523746
 $S = 3$
 $T = 2$
 $U = 0$
 $V = 1$
 $W = 1$
 $X = 1$
 $Y = 1$
 $Z = 1$
 5 inversions

(3) The puzzles are on odd number of jumps away (1) from each other, thus they cannot be reached. Its permutation has a disjoint cycle decomposition that is impossible.

9. A group is a set equipped with an operation that combines two elements to form a third element.

- (5) $\langle S \rangle$
 $\left[\begin{array}{c} 1 \\ 0 \end{array} \right]$ is closed: $A, B \in S \Rightarrow A \cdot B = C \Rightarrow \det(C) = \det(A \cdot B) = \det(A) \det(B)$
(a) Associative: $A, B, C \in S \Rightarrow (A \cdot B) \cdot C = (A \cdot (B \cdot C))$ known
(b) Existence: $A \in S \Rightarrow \exists I_{n \times n} = I \cdot A = A$
(c) Existence Inv. $A \cdot A^{-1} = A^{-1} \cdot A = I$

(6) I understand, am lost Dr. Z