Math 322 Homework 5

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Question 1. Tracing through each element $1, 2, \ldots, 7$ through the cycles, we have that the given permutation is equivalent to

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

Again manually tracing through the paths, we can factor this into $(127)(3)(4)(5)(6)$

Question 2. Let $\alpha \in A_n$. Every permutation can be decomposed into disjoint cycles, write this as $\alpha = (i_1 i_2 \cdots i_r) \cdot (j_1 j_2 \cdots j_s) = (i_1 i_r) \cdots (i_3 i_1)(i_2 i_1)$

Question 3. Recall from class/the textbook that multiplying by a