Worksheet 7

1. Write $(1\,3\,5\,2)(4\,6\,7)$ as a product of transpositions.
2. Let σ be a k-cycle. Suppose m is a positive integer and r is the remainder when we divide m by k. Prove that $\sigma^m = \sigma^r$.
3. (a) Let $\sigma = (1\,2\,3\,4\,5)(6\,7)$. Find the smallest positive m such that $\sigma^m = (1)$.
   (b) Let $\tau = (1\,2\,3\,4\,5\,6)(7\,8)$. Find the smallest positive m such that $\tau^m = (1)$.