Assigned reading: Chapters 7, (parts of 31), 5 of Gallian.

Recommended practice questions:

Chapter 7 of Gallian, exercises 42, 44
Chapter 31 of Gallian, exercises 5, 10
Chapter 5 of Gallian, exercises 1, 2, 3, 12, 16, 73
Chapter 6 of Gallian, exercises 19, 47

Assigned questions to hand in:

(1) (Gallian Chapter 0 # 52) The ISBN-10 0–669–03925–4 is the result of a transposition of two adjacent digits not involving the first or last digit. Determine the correct ISBN-10. Justify your answer.

(2) (Gallian Chapter 5 # 6) What is the order of each of the following permutations? Justify your answers.
   (a) \[
   \begin{pmatrix}
   1 & 2 & 3 & 4 & 5 & 6 \\
   2 & 1 & 5 & 4 & 6 & 3
   \end{pmatrix}
   \]
   (b) \[
   \begin{pmatrix}
   1 & 2 & 3 & 4 & 5 & 6 & 7 \\
   7 & 6 & 1 & 2 & 3 & 4 & 5
   \end{pmatrix}
   \]

(3) (Gallian Chapter 5 # 9) What are the possible orders for the elements of \(S_6\) and \(A_6\)? What about \(A_7\)? Justify your answers.

(4) (Gallian Chapter 5 # 14) Find eight elements in \(S_6\) that commute with \((12)(34)(56)\). Do they form a subgroup of \(S_6\)?

(5) (Gallian Chapter 5 # 74) Let \(H = \{\alpha^2 : \alpha \in S_6\}\). Prove that \(H \neq A_6\).

(6) (Gallian Supplementary 5-8 # 62) Let \(H = \{\alpha \in S_n : \alpha \text{ maps the set } \{1,2\} \text{ to itself}\}\). Prove that \(C((1,2)) = H\).