

120A: Homework 4

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Since we have an extra grader for the course, almost all problems will be graded in detail. The book exercises are worth 60 percent, and the extra exercises are worth 40 percent. Write the solutions of the two different parts on different papers.

1. EXERCISES FROM BOOK

We will check the following exercises from the book.

Section 8: 2, 10, 12, 17, 40, 46

Section 9: 2, 9, 10, 13, 17, 29

2. EXTRA EXERCISES

Exercise 1

Find a permutation $\sigma \in S_5$ such that

$$\sigma^2 = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 2 & 3 & 1 & 4 & 5 \end{pmatrix}.$$

Exercise 2

Find all the subgroups of S_3 .

Exercise 3

Show that the smallest subgroup of S_n containing $A = \{(1, i) : i = 2, 3, \dots, n\}$ is equal to S_n (“ A generates S_n ”).