

HOMEWORK #2 (DUE FRIDAY, OCT. 17).

10/10/2014

Note: Turn in only the “starred” problems; out of these, selected problems will be graded.

Section 3.3: Exercises 3, 7, 8, 9*.

Section 3.4: Exercises 1, 2, 6, 8*, 9, 10.

Section 3.5: Exercises 2, 3, 4*, 5*, 6, 9, 10, 14.

Section 4.1: Exercises 1, 2, 3, 9.

Section 4.2: Exercises 7, 8*, 10.

Section 4.3: Exercises 5, 6, 23*, 24*, 25, 26, 27, 28, 30, 32.

Additional problems:

1*) Let G be a subgroup of S_n . Prove the following statements:

(i) If $G \cap A_n = \{id\}$, then $|G| \leq 2$.

(ii) If $|G| > 2$ and G is simple, then $G \subset A_n$.

2*) Prove the following statements:

(i) If $n \geq 5$, then S_n has no subgroup of index m with $2 < m < n$.

(ii) If $n \geq 5$, then A_n has no subgroup of index m with $2 \leq m < n$.