### 18.440 PROBLEM SET ONE, DUE FEBRUARY 11

## A. FROM TEXTBOOK CHAPTER ONE:

1. Problems: 9, 24, 31.
2. Theoretical Exercises: 8, 9, 13, 23
3. Self-Test Problems and Exercises: 14.
B. Consider permutations $\sigma:\{1,2, \ldots, n\} \rightarrow\{1,2, \ldots, n\}$.
4. How many such $\sigma$ have only one cycle, i.e., have the property that $\sigma(1), \sigma \circ \sigma(1), \sigma \circ \sigma \circ \sigma(1), \ldots$ cycles through all elements of $\{1,2, \ldots, n\}$ ?
5. How many $\sigma$ are fixed-point-free involutions, i.e., have the property that for each $j, \sigma(j) \neq j$ but $\sigma \circ \sigma(j)=j$ ?
