Always justify your answers, even if the question does not explicitly say so! Write your own solutions, independently of anyone else. For the problems in Section 7.3, use Burnside’s Theorem. Be sure to justify your answers carefully by saying what $S$ and $G$ are, and explaining how you computed $|\text{Fix}(g)|$ for each element $g \in G$.

Core Problems: Everyone must turn these problems in.

I. Sec. 7.3 # 7, 9, 10d, 11.

II. Sec. 7.4 # 1 b (Use the definitions on p. 237–8.)

III. Prove that any finite group of rotations about the origin in $\mathbb{R}^2$ must be cyclic. (See # 7.4.7 for a hint.)

IV. Sec. 7.4 # 23 ac (Here you are being asked to find the full isometry group, including reflections in planes through the origin. Before doing (c), give a definition of the truncated cube.)

Advanced Problems: Due one week later than the Core Problems. Compulsory for 6010 students; optional for 4010 students. Always justify your answers.

V. Sec. 7.4 # 22.