SOAR Math Course   Homework Thirteen   Winter, 2002

These homework problems are meant to expand your understanding of what goes on during class. Any you turn in will be graded and returned to you. Answers may or may not be posted on the web, depending on demand.

Also, recall that I've updated the cube solutions to fix the problem in step 6. (The problem was that I had mistakenly used "B" when I meant "D." I'm still very sorry.)

1. Go back and do problems 2(d) and (c) from Homework Eleven. That is, we've seen that the order of UR is 105 (or $(\mathsf{UR})^{105} = 1$ but $(\mathsf{UR})^k \neq 1$ for $0 < k < 105$). Do the same thing for

   (a) UR^2 (this was 11.2(d))

   (b) UR^{-1} (this was 11.2(c))

2. (a) What is the largest possible order for a single move?

   (b) What is the order of $\mathsf{RF}^2\mathsf{B}^{-1}\mathsf{UB}^{-1}$? (This move is taken from Frey & Singmaster; see the bibliography.)

3. Create two new moves:

   (a) one with a *conjugate* XYX^{-1}, and

   (b) one with a *commutator* $[\mathsf{X},\mathsf{Y}] = \mathsf{XYX}^{-1}\mathsf{Y}^{-1}$.

   The simplest way to do this is to start with a solved cube and a relatively simple move (or moves) Y.