

## Quiz 2 results

The marks for quiz 2 have been posted; the average was 57%. I found it very distressing to mark, based on the kind of answers that were written, and I am worried that many of you may fail the final exam.

Almost no one got full marks for the question "What is the smallest non abelian group", and this was mainly because a lot of people gave relatively nonsensical answers like " $Z_2$ ", " $Z_2(+)Z_2$ ", " $D_n$ " (for no specified  $n$ , just any  $n$ ), the permutation group on 5 things (which has 120 elements), " $D_2$ " (which, if you think about it, is the set of symmetries of a line segment, and you can show that  $|D_2| = 2$ ), " $D_1$ " (which I presume is the symmetries of a point, which you could argue is infinite, and certainly not of order 5 like was claimed),  $SL(2, \mathbb{R})$  which is infinite, "the empty group" which is not a thing, " $U(8)$ ". At least one person claimed that  $Z_4$  "is only sometimes cyclic". Some people tried to construct a nonabelian group of order 3 or 4 with nonsense relations, forgetting that all groups of prime order are abelian (and cyclic), and that there are only two groups of order 4, both abelian.

A nontrivial number of people said  $Z_{12}$  wasn't cyclic.

This is the end of the course now, and if you do not know what an abelian group is, that  $Z_n$  is always cyclic and abelian, that groups of prime order are abelian, etc, there is a serious issue, and it makes me very worried. I know this is a very abstract course, and is probably your first introduction to proper abstraction, but these issues are week 2 issues, not week 12 issues. I implore you to study all of the material very carefully.

For the definitions if you said a left coset of  $G$  in  $H$  was the set " $aH$ ", and said nothing further... that's not a definition. You need to tell me what the set " $aH$ " is. Similarly, if you said the factor group was " $G/H$ ", you have to define what that set is.

The final is coming up soon, and is worth 45% of your final mark. Here are some suggestions for helping you to pass the exam:

- (1) Know all of the definitions in the course. Don't just memorise them, *know* them and understand them. Know what each word in the definition means.
- (2) When you have a question to do, write down the definitions of all of the pieces involved. You can usually see from here where to go.
- (3) Understand the theorems, and be able to write down their statements. If you're using a theorem in a proof, either state it by name (if it has one), or quickly reference what it says.
- (4) Do as many practice problems as you can. Look at old final exams, and try to do them (but realise you may not have learned the exact same material). Do the problems using suggestions 1-3 above.

I will try to get the quizzes back to Dinakar soon, and would strongly suggest that you all go to get them back and look over them, and try to understand where you went wrong.