

Algebra - hw # 4

fall 2008

- Remember when you first started to like math? Remember how simple things were? Let's try to keep it that way. Some of you complicate things way too much. Let's try to work on keeping things simple, as much as possible.
- Quote of proof: everything we do here has been done before. Every problem could be done in a line starting by "as we all know" or "as it has been known for years". This is not nice, please don't do it; thank you.

1 Problem 2

(2f) They ask for numbers, your answer should be in the form of numbers. They didn't ask you a formula to obtain those numbers. If they wanted the formula they would have asked for the formula, wouldn't they? It doesn't matter if what you offer is "better" (whatever that means) than what they ask for; this is a problem of understanding what they want, and being able to deliver.

(2h) Just to make sure: if you want to see that something (say α) has order say 3, you need to see not only that $3\alpha = 0$ but also that $\alpha \neq 0$. Some of you suggested that an element of order 3 could be $z - x$ (or other things like this) without any further checking.

Problem 3 Many of you thought you were proving $\text{Aut}A = \prod_p A_p$ when what you were actually showing was $\text{Aut}A \subseteq \prod_p A_p$

Problem 5

- You were asked to give a counter example A , namely an abelian group A that is *not* a direct sum of cyclic groups. Many of you instead try to construct counterexamples based on the fake proof. Now what would that be a counter example of, given that the proof is wrong? Certainly not of the statement of the fake theorem. • Some of you chose a group and proved that it couldn't be written as a direct sum of certain cyclic groups. What about other cyclic groups?