Math 113(4) - Comments for HW11

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November 12, 2018

Some general comments:

1. Please use staplers or clips, not just fold the left-upper corner of papers!

2. Try to write well! - maybe this will be harder than the first one...

3. If you can, try to use LaTeX.

4. For questions that requires proofs, I almost not give any partial credits.

Problem 1

If you define a map on cosets (such as $\phi : AB/B \to A/(A \cap B)$, $\phi(abB) = a(A \cap B)$) or on AB (such as $\phi' : AB \to A/(A \cap B), \phi'(ab) = a(A \cap B)$), you must show that the map is well-defined (Actually, the latter map is not well-defined). If you didn't, I deducted one point. However, if define a map on A (such as $\psi : A \to AB/B, \psi(a) = aB$), you don't have to show well-definedness.

Problem 2

(a)

1. $C(R)$ is a subgroup of R under addition. (1.5 points)

2. Closed under multiplication. (1 point)

(b) You have to show that $C(R)$ is closed under taking inverse of nonzero element. Especially, you have to check that the inverse of element $z \in C(R)$ in R lies in $C(R)$, i.e. $z^{-1}r = rz^{-1}$ for all $r \in R$. If you didn't show this, I deducted 1 point.

Problem 3

$\binom{p}{i}$ is a multiple of p for $0 < i < p$.

Problem 4 (Section 26, Exercise 2)

Some of the arguments are really hard to understand. You must to show clearly that n is a form of $2(2k + 1)$ for some $k \geq 0$. If you only show that n is even or you 'proved' that $n = 2m$ for some odd m but the argument is weak or even wrong, I only gave 3 points. Especially, I can't give you a full credit if you only wrote $2m = 0, 3m = m$ and 'so m is odd'.