MA3823 Group Theory
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December 4, 2012

Group Theory Assignment 4

Due Date: Monday December 10, 2012, by 4:30pm in my office mail slot. The faculty mailboxes are in the Department Office, SH108.

Please recall the presentation rules for assignments in this course.

1. Let H be a subgroup of $\mathbb{R}^*$, the group of nonzero real numbers under multiplication. If $\mathbb{R}^+ \subseteq H \subseteq \mathbb{R}^*$, prove that $H = \mathbb{R}^+$ or $H = \mathbb{R}^*$.
2. Let G be a group with $|G| = pq$ where p and q are prime. Prove that every proper subgroup of G is cyclic. (Must G be cyclic?)
3. Suppose G is a finite group of order n and m is relatively prime to n. If $g \in G$ and $g^m = e$, prove that $g = e$.
4. # 24 on p157
5. # 38 on p158
6. # 43 on p158
7. # 47 on p158
8. # 48 on p158
9. # 27 on p175
10. # 39 on p176