Math 321: Foundations of Abstract Algebra

HOMEWORK 6 : DUE MARCH 13

No late homework will be accepted on this assignment. It is due in class or by 7 PM if you LATEX it.

1. # 11.1 You may assume we already know it is a subgroup.

2. (a) #11.10

   (b) Give an example to show that the order of Hg in G/H may be strictly smaller than the order of g in G.

3. #11.14

4. (8 points) (a) # 11.17

   (b) # 11.18

   (c) If H and G/H are abelian, must G be abelian?

5. # 11.27 (b) and (c). You should convince yourself of (a) but you don't need to write it up.

6. # 11.29

7. # 12.1 (a), (b), (d)

8. # 12.7

9. # 12.13 (This completes a piece of a proof from class.)

Extra

1. Assume both H and K are normal subgroups of G with $H \cap K = e$. Prove that $xy = yx$ for all $x \in H$ and $y \in K$.