

Math 128A, problem set 08
Outline due: Wed Apr 08
Due: Mon Apr 13
Last revision due: Wed May 13

Problems to be done, but not turned in: (Ch. 8) 23, 33, 43, 53; (Ch. 9) 3, 7, 9, 15, 21, 21, 25, 37, 41, 49, 57, 61, 67.

Fun: (Ch. 8) 29; (Ch. 9) 36, 58.

Problems to be turned in:

1. (Ch. 8) 40. Prove your assertion.
2. (Ch. 8) 50.
3. (Ch. 9) 12.
4. (Ch. 9) 14.
5. (Ch. 9) 26.
6. (Ch. 9) 38.
7. (Ch. 9) 46. (You may take it as given that H is a subgroup of G , and that H is normal in G , since G is abelian.)
8. Let n be an integer greater than 2. Recall (PS02, class) that for $r = R_{360/n}$ and f any reflection in D_n , we know that $r^n = f^2 = e$ and $frf^{-1} = r^{-1}$, and that

$$D_n = \{r^i, r^i f \mid 0 \leq i < n\}.$$

- (a) Prove that $\langle f \rangle$ is not normal in D_n .
- (b) Let k be a divisor of n , and let $H = \langle r^k \rangle$. Prove that H is normal in D_n .