Abstract Algebra
Homework

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1. Suppose G is a finite group and f is an automorphism of G that sends more than three quarters of the elements of G to their inverse. Show G is abelian.

2. Give an example of a non-abelian group G that has an automorphism sending exactly three quarters of the elements to their inverse.

3. Let G be a group of order $2n$ where n is odd. By Cayley's Theorem, we know that G is isomorphic to a subgroup of S_{2n}. Show in this embedding that the elements of odd order in G end up in A_{2n}. Conclude that the elements of odd order in G form a subgroup and there are no simple groups of order $2n$. for n odd.

4. 4.6 4

5. Show any simple group of order 60 is isomorphic to A_5.

6. 4.6 6

7. 4.6 7

8. 4.6 8