MS321 Algebra, Tutorial 9

1. Up to isomorphism, how many abelian groups are there of order 42, 36, 37?

2. If G is a finite abelian group and p is a prime factor of $|G|$, prove that G has an element of order p.

3. Use the structure theorem for finite abelian groups to prove that every abelian group of order 72 has at least one element of order 6.

4. What is the structure of the abelian groups $\mathbb{Z}_{36}^*$ and $\mathbb{Z}_{21}^*$?