

MAT 534: HOMEWORK 4
DUE THU SEP 26

1. Let G be a non-abelian group of order p^3 , where p is a prime. Find the number of its conjugacy classes and number of elements in each class.
2. Let $|G| = 105$. It follows from the theorem on the subgroups of the smallest prime index dividing the order of a group (proved in class), that Sylow 7-group is normal in G . Prove that Sylow 5-group is also normal. Prove that if G has a normal Sylow 3-subgroup, then G is abelian.
3. Let G be a group of order p^2q , where p, q are primes, $p < q$. Assume that p does not divide $q - 1$. Prove that then G is abelian.
4. Classify all groups of order 75.
5. Classify all groups of order 20.