

MATH 3360 HOMEWORK ASSIGNMENT 7

DUE ON FRIDAY 13 MARCH 2020

- (1) Find, up to isomorphism, all abelian groups of order 84.
- (2) Let p , q , and r be primes. Find, up to isomorphism, all abelian groups of order p^3q^2r .
- (3) Let G be an abelian group and $\pi: G \rightarrow G$ a group homomorphism with $\pi^2 = \pi$.
 - (a) Show that $g - \pi(g)$ belongs to $\text{Ker } \pi$ for every $g \in G$.
 - (b) Show that G is isomorphic to $\pi(G) \times \text{Ker } \pi$.
- (4) Let p be a prime. Show that every group of order p^2 is abelian. (Hint: problem (2) on Homework Assignment 6.)
- (5) Show that the group of inner automorphisms of S_3 is isomorphic to S_3 .