



MODERN ALGEBRA 1
SPRING 2010

HOMEWORK 12.1
DUE APRIL 21

Exercise 1. How many abelian groups are there of order n if $n = 2008, 2009, 2010$ or 2011 ?

Exercise 2. Let G be an abelian group (written additively). Recall that for $m \in \mathbb{N}$ we defined

$$G_m = \{x \in G \mid mx = 0\}$$

and if p is a prime we defined

$$G(p) = \{x \in G \mid |x| \text{ is a power of } p\}.$$

a. Prove that if $n \in \mathbb{N}$ and $m|n$ then $G_m = (G_n)_m$.

b. Prove that $G(p) = \bigcup_{i=0}^{\infty} G_{p^i}$.