Assignment 4

MA08 Applied Algebra Deadline 05:00 PM, Friday, 20190628

1. Let G be an abelian group, and let n be a fixed positive integer. Show that $N = \{g \in G \mid g = a^n \text{ for some } a \in G\}$ is a subgroup of G.

2. Write at least 5 elements of each of the following cyclic groups.

   (a) $25\mathbb{Z}$ under addition.

   (b) $\{(\frac{1}{2})^n \mid n \in \mathbb{Z}\}$

3. Which of the following groups are cyclic? For each cyclic subgroup, list all the generators of the group.

   (a) $G_1 = \langle \mathbb{Z}, + \rangle$

   (b) $G_2 = \langle \mathbb{Q}, + \rangle$

   (c) $G_3 = \langle 6\mathbb{Z}, + \rangle$

   (d) $G_4 = \{6^n \mid n \in \mathbb{Z}\}$ under multiplication

   Notice: Please write Your Name and Student ID when you submit.