

淡江大學 96 學年度轉學生招生考試試題

29

系別：數學學系數學組三年級

科目：代

數

可否使用計算機			
可		否	✓

本試題共 / 頁

Show your work.

1. Prove that $\{1, -1, i, -i\}$ is a cyclic group under the usual multiplication. (10%)
2. Show that a group G is abelian if for each g in G $g^2 = e$, where e is the identity of G . (15%)
3. Show that any group order 7 is cyclic. (15%)
4. Let G be a group such that $200 < |G| < 300$. Suppose G has subgroups of order 21 and 33, find $|G|$. (15%)
5. Let R be a commutative ring with identity 1. Prove that an ideal P is a prime if and only if R/P is an integral domain. (15%)
6. Prove that Z is a PID, where Z is the set of integers. (15%)
7. Up to isomorphism, find all abelian groups of order 12. (15%)