

MATH 535

HOMEWORK ASSIGNMENT 4

due on Monday, 10/04/04

- 11.** #2.80: Prove that no pair of the following groups of order 8,

$$\mathbb{I}_8, \mathbb{I}_4 \times \mathbb{I}_2; \mathbb{I}_2 \times \mathbb{I}_2 \times \mathbb{I}_2; D_8; Q$$

are isomorphic.

- 12.** #2.91: (i) For all $n \geq 3$, prove that every $\alpha \in A_n$ is a product of 3-cycles. (ii) Prove that if a normal subgroup $H \triangleleft A_n$ contains a 3-cycle, where $n \geq 5$, then $H = A_n$.

- 13.** Find the number of rotationally distinct colorings of the faces of a cube using three colors.