

WrittenHW 8

1. [2] Is $SL(2, \mathbb{R})$ a normal subgroup of $GL(2, \mathbb{R})$? Justify your answer.
2. [2] Find n such that $\langle 3 \rangle / \langle 12 \rangle \cong \mathbb{Z}_n$. Prove it.
3. [3] Let k and m be integers with $k > m$. Find n such that $\langle m \rangle / \langle k \rangle \cong \mathbb{Z}_n$. Prove it.
4. [3] Construct a Cayley table for $U(20)/N$ where $N = \{x \in U(20) \mid x \bmod 5 = 1\}$.
5. [2] Determine the order of $\mathbb{Z} \oplus \mathbb{Z} / \langle (2, 2) \rangle$.
6. [3] Construct a Cayley table for H/N where H is the group defined on the midterm #5a and $N = \{1, -1\}$.