

Math 124

Problem Set IV

Due: Friday, February 25, 2005

1. Fix C and θ so that $\rho_{C,\theta} \neq i$, and let m be a line.

Prove: $\sigma_m \rho_{C,\theta} \sigma_m = \rho_{C,-\theta}$ if and only if C is on m .

2. Suppose γ_1 and γ_2 are glide reflections with axes m_1 and m_2 respectively.

Prove:

a. If m_1 and m_2 are parallel, then $\gamma_1\gamma_2$ is a translation.

b. If m_1 and m_2 are not parallel, then $\gamma_1\gamma_2$ is a rotation.

3. Prove: If γ is a glide reflection, then $\gamma = \sigma_p \sigma_n \sigma_m$, where any one of lines m , n , and p can be any arbitrarily chosen line not parallel to the axis of γ .

Extra Credit: Prove: The above statement also holds if the chosen line is parallel to the axis of γ . (The proofs for m , n , and p are similar. Just do one.)