Math 124
Problem Set III
Due: Wednesday, February 16

1. **Prove:** For any two distinct lines $m$ and $n$ and any point $P$, $\sigma_m\sigma_n$ fixes $P$ if and only if $P$ is on both $m$ and $n$.

2. Suppose that $A=(-1,0)$, $B=(-4,3)$, $C=(3,-2)$, and $D=(5,12)$. Find equations of lines such that the product of reflections in these lines sends ray $\overrightarrow{CD}$ to ray $\overrightarrow{AB}$. Clearly explain your work.

3. **Prove:** If $\sigma_n\sigma_m\sigma_l$ is a reflection, then lines $l$, $m$, and $n$ are concurrent or parallel.