Problem 9. Let $A$ and $B$ be distinct points in the plane. Let $\mathcal{L}$ be the collection of all lines in the plane that contain the point $B$. For each line $\ell \in \mathcal{L}$, let $A_\ell$ be the reflection of $A$ in the line $\ell$. Describe, with proof, the complete set of points $\{A_\ell : \ell \in \mathcal{L}\}$.

Solutions due by 10:00am Monday, October 26.