1. (10 points) Let $A := \{\ell : \ell \text{ is a line in the Cartesian plane}\}$ and let $x \perp y$ iff $x$ and $y$ are perpendicular lines. Please explain why $\perp$ is or is not reflexive, symmetric and transitive.

2. (4 points) What is the key distinction between a function and a relation?

3. (6 points) Suppose $A$ and $B$ are sets and $f : A \to B$ is a function. What must be true if $f$ is 1-1? What must be true if $f$ is onto?