1. Let $X$ be a topological space. Consider the following topological properties:

- normal
- Hausdorff
- compact
- connected
- path connected
- metrizable

a. Let $A$ be a subspace of $X$. For which of the above properties does it necessarily follow that if $X$ has that property then $A$ has that property. No proofs required.

b. Let $A$ be a closed subspace of $X$. For which of the above properties does it necessarily follow that if $X$ has that property then $A$ has that property. No proofs required.

c. Let $X/\sim$ be a quotient space of $X$. For which of the above properties does it necessarily follow that if $X$ has that property then $X/\sim$ has that property. No proofs required.

2. a. If $X$ is a topological space, then what may one conclude about the components of $X$? No proof required.

b. If $X$ is locally connected, then what may one conclude about the components of $X$? No proof required.

c. If $X$ is locally path connected, then what may one conclude about the components of $X$? No proof required.