

Name: _____ Score (Out of 5 points):

1. (2 points) Let $X = \{a, b, c, d\}$ be a topological space with the topology

$$\mathcal{T} = \{\emptyset, \{a\}, \{a, b\}, \{a, b, c\}, \{a, b, c, d\}\}.$$

Write down a formula for a continuous path in X from a to d . **No justification necessary.**

2. (3 points) Let (X, \mathcal{T}_X) and (Y, \mathcal{T}_Y) be topological spaces, and $f : X \rightarrow Y$ a continuous function. Show that, if X is path-connected, then $f(X)$ is path-connected.

