Name: _____ Score (Out of 6 points):

1. (6 points) State whether each of the following functions is continuous and/or open by circling "`Continuous`" and/or "`Open`". No justifcation necessary.

$f : (\mathbb{R}, \text{cofinite}) \to (\mathbb{R}, \text{Euclidean})$ $f(x) = x$	`Continuous`	`Open`
$g : (\mathbb{R}, \text{discrete}) \to (\mathbb{R}, \text{Euclidean})$ $g(x) = x$	`Continuous`	`Open`
$k : (\mathbb{R}, \text{indiscrete}) \to (\mathbb{R}, \text{Euclidean})$ $k(x) = x$	`Continuous`	`Open`
Let $X = \mathbb{R}$ and $\mathcal{T} = \{(a, \infty) \mid a \in \mathbb{R}\} \cup \{\mathbb{R}\} \cup \{\varnothing\}$. $h : (\mathbb{R}, \mathcal{T}) \to (\mathbb{R}, \text{cofinite})$ $h(x) = x$	`Continuous`	`Open`
Let X, Y be any topological spaces, and endow $X \times Y$ with the product topology. Let π_X be the projection map $\pi_X : X \times Y \to X$ $\pi_X(x, y) = x$	`Continuous`	`Open`
Let $X = \{a, b, c, d\}$ and $\mathcal{T} = \Big\{\varnothing, \{a, b\}, \{c\}, \{a, b, c\}, \{a, b, c, d\}\Big\}$. $F : (\mathbb{R}, \text{Euclidean}) \to (X, \mathcal{T})$ $F(x) = \begin{cases} a, & x \in (0, 1] \\ b, & x \in (1, \infty) \\ c, & x \in (-\infty, 0) \\ d, & x = 0. \end{cases}$	`Continuous`	`Open`