Name:

Problem 1: Pat claims that the subspace $Y = [-1, 0) \cup (0, 1] \subset \mathbb{R}$, where $\mathbb{R}$ has the usual topology, is not connected, because $U = [-1, 0)$ and $V = (0, 1]$ form a separation of Y. Sam disagrees, and says that this argument doesn't work, because $[-1, 0)$ and $(0, 1]$ are not open.

Who is correct? Justify your answer with **one** sentence.