characterization of connected compact metric spaces.

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Let (A, d) be a compact metric space. Then A is connected $\Longleftrightarrow \forall x, y \in A$, $\forall \varepsilon > 0 \; \exists \, n \in \mathbb{N}$, and $p_1, ..., p_n \in A$, such that $p_1 = x$, $p_n = y$ and $d(p_i, p_{i+1}) < \varepsilon \; (i = 1, ..., n-1)$