Let $(X, \mathcal{B}, \mu)$ be a complete, finite measure space. For each sets $A, B \in \mathcal{B}$, define

$$d(A, B) = \mu(A \Delta B)$$

where $A \Delta B$ is the symmetric different of A and B:

$$A \Delta B = (A \cup B) \backslash (A \cap B) = (A \backslash B) \cup (B \backslash A)$$

Introduce the equivalence relation on the family of all measurable sets by declaring A and B equivalent if $d(A, B) = 0$. Let E be the space of equivalence classes. Prove that d introduces a metric on E and that (E, d) is a complete metric space.