

1. Let f be a function from A to B . For each $a \in A$, define

$$P_a = \{x \in A : f(x) = f(a)\}$$

Prove that $\{P_a : a \in A\}$ is a partition of A .

2. Let \mathcal{P} be a partition of a set T . Define R to be the relation

$$R = \{(t, S) \in T \times \mathcal{P} : t \in S\}.$$

Prove that R is a function, with domain T .