

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 g be a function from S to T , and let h be function from T to U . Prove that if g^{-1} and h^{-1} are functions, then $(h \circ g)^{-1}$ is a function and that

$$(h \circ g)^{-1} = g^{-1} \circ h^{-1}.$$