Assignment 1 :

a) Show that a f^n $f: X \longrightarrow Y$ is onto if and only if $f(f^{-1}(B)) = B$ holds for all $B \subseteq Y$.

b) Show that the composition of f^ns satisfies the associative law:
$X \xrightarrow{f} Y \xrightarrow{g} Z \xrightarrow{h} V$, then
$(h \circ g) \circ f = h \circ (g \circ f)$.

c) Let $f: X \to Y$. Show that the relation R on X, defined by $x_1 R x_2$ if $f(x_1) = f(x_2)$, is an equivalence relation.

d) The power set $P(A)$ of a set A is the set of all subsets of A, including the empty set ϕ and the set A itself. Show the "cardinality" (the no. of elements in the set) of the $P(A)$ with justification.