Please explaine and show a detailed explanations:

i) If A is countable and f: A→B is surjective, show that B is countable.

ii). Show that a function f: A→B is bijective if, and only if, there is a function g: B→A

with gf = 1A and fg = 1B.

iii) If f: A→B, g: B→C and h: C→D are functions show that h(gf) = (hg)f.

vi) Let f: A→B and g: B→C be functions.

a) Show that if f is surjective and gf injective then g is injective.

b) Is it possible for gf to be injective when g is not? Explain.

v) Show that if A has n elements then Ƥ(A) has 2n elements, for all n ∈ N.

iv) Show that A =c B implies that Ƥ(A) =c Ƥ(B).