

PROOF:

a) Assume $A \subset B$. $y \in f(A) \Rightarrow \exists x \in A : f(x) = y$. Since $A \subset B$, then $x \in A \Rightarrow x \in B \Rightarrow f(x) \in f(B) \Rightarrow y \in f(B)$. Q.e.d.

b) Assume $C \subset D$. $x \in f^{-1}(C) \Rightarrow f(x) \in C \Rightarrow f(x) \in D \Rightarrow x \in f^{-1}(D)$. Consequently, $f^{-1}(C) \subset f^{-1}(D)$.