1. Suppose that $f : X \to Y$ is a function, and $A \subset X$. Prove or give a counterexample:
\[ Y \setminus f(A) \subset f(X \setminus A). \]
As usual, a counterexample means giving explicit sets $X$, $Y$, and $A$, and an explicit function $f : X \to Y$.

2. Suppose that $f : X \to Y$ is a function, and $B \subset Y$.
   (a) Show that $f(f^{-1}(B)) \subset B$.
   (b) Give an explicit example in which $f(f^{-1}(B)) \neq B$.
   (c) Suppose that $f$ is a surjective function. Show that $f(f^{-1}(B)) = B$. 