Directions. Please submit your answer to the following problem in a \LaTeX- prepared document. Class participants are encouraged to prepare solutions in a collaborative mode but to prepare their to-be-submitted write-ups individually. The consequences of sharing files, electronic or otherwise, are discussed in the course syllabus.\footnote{If the wording of this problem was discussed in detail in the classroom, the course instructor expects to see similar phrases and sentences in reading the submissions.}

Please include the problem number along with a statement of the problem in your submission. Please also include your e-mail address.

Problem. Recall that \( f^{-1}(C) = \{ x : x \in X \land f(x) \in C \} \).

Let \( A \) denote a subset of a non-empty set \( X \) and let \( C \) denote a subset of a non-empty set \( Y \). Let \( f : X \rightarrow Y \). If the statement is correct provide a proof. If the statement is incorrect, provide a counter example. If a reasonable hypothesis can be added that will make the statement correct, provide the hypothesis and a corresponding proof.

\[ f^{-1}(f(A)) = A. \]