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.¹

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

Recall that \( A \triangle B = (A \cup B) \setminus (A \cap B) \) which is equivalent to \( A \triangle B = (A \setminus B) \cup (B \setminus A) \).

**Problem.** Let \( X \) and \( Y \) denote non-empty sets and \( f : X \to Y \). Let \( A \) and \( B \) denote non-empty subsets of the set \( X \). If the following statement is correct, provide a proof. If it is not correct provide a counter example. If a reasonable hypothesis can be added that will make the statement correct, provide the hypothesis and a corresponding proof.

\[
f(A \triangle B) = f(A) \triangle f(B).
\]

¹If 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.