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Provide your work for each question. State your propositions/sentences clearly. **There are 2 questions.**

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- Clearly label question numbers.
  - Make sure your handwriting is readable otherwise your work will receive zero point.
  - **Do not submit scratch work. Submit the final product.**
  - **If DISPROVING, Enough to give a counter example with a clear description of why the example falsifies the statement.**
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1. Prove/Disprove:

Given  $f: D \rightarrow \mathbb{R}$  with  $D$  is compact, and  $f$  is 1-1 and differentiable

on  $D$ . Consider the function,  $h(x) = \frac{f(x) - f(x_0)}{x - x_0}$  for  $x_0 \in D$ .

Then,  $h$  is uniformly continuous on  $D$ .

(Note: Address specifically the point,  $x_0$  along with other points on your Proof/Disproof. No grade will be warranted if  $x_0$  is not addressed).

2. Prove/Disprove:

Given a compact set  $A$ .

Then, for any member  $a_0 \in A$ ,  $A \setminus \{a_0\}$  is compact.

**Attach your work as a pdf, word or jpeg back into the assignment link on blackboard** **Make sure to check and open the submitted file to guarantee that the file was not corrupted.**