Math CS Topology HW5

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> **Question 1** *Prove that if X is connected and $x \in X$ then $X \times X \setminus \{(x,x)\}$ is connected*

Pf:

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Question 2 *Prove that every open connected subset of $\mathbb{R}^2$ is path connected.*

Pf:

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> **Question 3** *Suppose X and Y are compact Hausdorff spaces. Prove that every continuous bijection $f : X \to Y$ is a homeomorphism.*

Pf:

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Question 4 *Let X be a totally ordered set with the order topology. Prove that every nonempty compact subset of X has a maximum element.*

Pf: