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Steven C. Leth* (steven.leth@unco.edu), School of Mathematical Sciences, University of Northern Colorado, Greeley, CO 80639. *Some questions and answers about “fixed point traps” in the plane.* Preliminary report.

Regions in the nonstandard plane that contain no standard point have previously been investigated by the author with the goal of creating “fixed point traps.”

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Let E be a standard compact, connected subset of the plane whose complement is also connected. Let f be a standard continuous function from E to E . We are interested in the general problem of finding conditions that can be added to those below that allow us to conclude that f has a fixed point.

- i) D is a connected subset of *E and V is a connected open region whose closure contains D .
- ii) V contains no standard points.
- iii) The boundary of V , except on an arc A of infinitesimal length, is contained in the complement of *E .
- iv) There exists a point $p \in D \cap A$ and an internal topological disk B such that the connected component of $f(p)$ in ${}^*E - B$ is contained in V .

We look at some examples of such conditions and some conjectures and their implications. (Received December 13, 2011)