

An application of the Borsuk-Ulam's theorem to a lineability problem

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Abstract. Let K be a subset of R^m . We consider the subset $\hat{C}(K)$ of $C(K)$ formed by the functions that attain their maximum at only one point of K .

We showed in [1] that if $m < n$ and K is a compact subset of R^m then there isn't a n -dimensional linear subspace V of $C(K)$, such that $V - \{0\} \subset \hat{C}(K)$.

This result is an application of the Borsuk-Ulam's theorem and it generalizes a theorem proved in [2] by Gurariy and Quarta.

References

- [1] Botelho G.; Cariello D.; Favaro V.; Pellegrino D. ; Seoane Sepulveda J.B. On very non-linear subsets of continuous functions. arXiv:1212.4395
- [2] Gurariy V.I.; Quarta L. On the lineability of sets of continuous functions. *J. Math. Anal. Appl.* **294** (2004), no. 62-72.