

Exercises

4.13 [17T] Topics: separation, support. Prerequisites: [170], [17J], [17B].

Given $A \subset \mathbb{R}^n$ convex non-empty and $z \in \partial A$, prove that there exist $v \in \mathbb{R}^n$, $a \in \mathbb{R}$ such that $\langle z, v \rangle = a$ and $\forall x \in A, \langle x, v \rangle \leq a$. The hyperplane thus defined is called *support hyperplane* of z for A .

Solution 1. [17V]