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Journal of Convex Analysis 30 (2023) 205–216

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Extreme Points of Convex Sets

Given a nonempty set $E \subset \mathbb{R}^n$, we provide necessary and sufficient conditions for the existence of a convex set $K \subset \mathbb{R}^n$ (possibly, nonclosed and unbounded) such that $\text{ext } K = E$. Also, we describe a family of convex sets $K \subset \mathbb{R}^n$ satisfying the equality $K = \text{conv}(\text{ext } K)$, and, more general, $K = \text{conv}(\text{ext } K) + \text{rec } K$, where $\text{rec } K$ denotes the recession cone of K .

Keywords: Convex set, convex hull, extreme point, recession cone.

MSC: 52A20, 90C25.