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## proper cone

Canonical name ProperCone

Date of creation 2013-03-22 14:37:13 Last modified on 2013-03-22 14:37:13 Owner dooder0001 (4288) Last modified by dooder0001 (4288)

Numerical id 7

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Entry type Definition
Classification msc 52A20
Related topic Cone3
Related topic Cone5

A proper cone is a http://planetmath.org/Cone3cone  $C \subset \mathbb{R}^n$  that satisfies the following:

- C is convex;
- C is closed;
- C is solid, meaning it has nonempty interior;
- C is pointed, meaning  $x, -x \in C \Rightarrow x = 0$ .

A proper cone C induces a partial ordering on  $\mathbb{R}^n$ :

$$a \prec b \Leftrightarrow b - a \in C$$
.

This ordering has many nice properties, such as transitivity, reflexivity, and antisymmetry.

## References

[1] S. Boyd, L. Vandenberghe, *Convex Optimization*, Cambridge University Press, 2004.