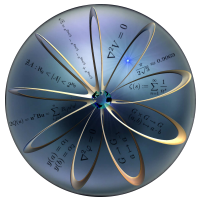

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basic properties of seminorms

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Proposition 1. *Suppose $p\colon V \to \mathbb{R}$ is a seminorm on a real (or complex) vector space V. Then*

1. *$p(0) = 0$,*
2. *$p(v) \geq 0$ for all $v \in V$.*

Proof. Property 1 follows using homogeneity;

$$p(0) = p(0 \cdot 0) = |0|p(0) = 0.$$

Property 2 follows using sublinearity and Property 1;

$$0 = p(0) = p(v - v) \leq p(v) + p(-v) = 2p(v).$$

□