



Math for the people, by the people.

## Weyl chamber

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Entry type	Definition
Classification	msc 17B20
Defines	positive Weyl chamber
Defines	dominant weight

Let  $E$  be a Euclidean vector space,  $R \subset E$  a root system, and  $R^+ \subset R$  a choice of positive roots. We define the *positive Weyl chamber* (relative to  $R^+$ ) to be the closed set

$$\mathcal{C} = \{u \in E \mid (u, \alpha) \geq 0 \text{ for all } \alpha \in R^+\}.$$

A weight which lies inside the positive Weyl chamber is called *dominant*.

The interior of  $\mathcal{C}$  is a fundamental domain for the action of the Weyl group on  $E$ . The image  $w(\mathcal{C})$  of  $\mathcal{C}$  under the any element  $w$  of the Weyl group is called a *Weyl chamber*. The Weyl group  $W$  acts simply transitively on the set of Weyl chambers.