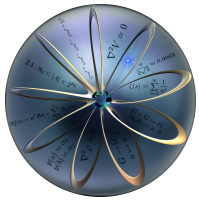

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Weyl group

Canonical name	WeylGroup
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The Weyl group W_R of a root system $R \subset E$, where E is a Euclidean vector space, is the subgroup of $\mathrm{GL}(E)$ generated by reflection in the hyperplanes perpendicular to the roots. The map of reflection in a root α is given by

$$r_\alpha(v) = v - 2\frac{(\alpha, v)}{(\alpha, \alpha)}\alpha.$$

The Weyl group is generated by reflections in the simple roots for any choice of a set of positive roots. There is a well-defined length function $\ell : W_R \to \mathbb{Z}$, where $\ell(w)$ is the minimal number of reflections in simple roots that w can be written as. This is also the number of positive roots that w takes to negative roots.