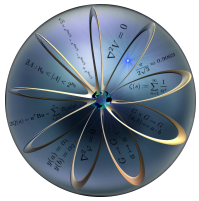

classification of finite-dimensional representations of semi-simple Lie algebras

Canonical name	ClassificationOfFinitedimensionalRepresentationsOfSemisimpleLieAlgebras
Date of creation	2013-03-22 13:11:40
Last modified on	2013-03-22 13:11:40
Owner	bwebste (988)
Last modified by	bwebste (988)
Numerical id	5
Author	bwebste (988)
Entry type	Definition
Classification	msc 17B20
Defines	highest weight
Defines	highest vector
Defines	vector of highest weight
Defines	highest weight representation

If $\mathfrak{g}$ is a semi-simple Lie algebra, then we say that an representation V has highest weight λ, if there is a vector $v \in V_\lambda$, the weight space of λ, such that $Xv = 0$ for X in any positive root space, and v is called a *highest vector*, or *vector of highest weight*.

There is a unique (up to isomorphism) irreducible finite dimensional representation of $\mathfrak{g}$ with highest weight λ for any dominant weight $\lambda \in \Lambda_W$, where Λ_W is the weight lattice of $\mathfrak{g}$, and every irreducible representation of $\mathfrak{g}$ is of this type.