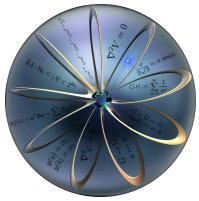

planetmath.org

Math for the people, by the people.

parabolic subgroup

Canonical name	ParabolicSubgroup
Date of creation	2013-03-22 13:28:02
Last modified on	2013-03-22 13:28:02
Owner	bwebste (988)
Last modified by	bwebste (988)
Numerical id	4
Author	bwebste (988)
Entry type	Definition
Classification	msc 17B20

Let G be a complex semi-simple Lie group. Then any subgroup P of G containg a Borel subgroup B is called *parabolic*. Parabolics are classified in the following manner. Let $\mathfrak{g}$ be the Lie algebra of G, $\mathfrak{h}$ the unique Cartan subalgebra contained in $\mathfrak{b}$, the algebra of B, R the set of roots corresponding to this choice of Cartan, and R^+ the set of positive roots whose root spaces are contained in $\mathfrak{b}$ and let $\mathfrak{p}$ be the Lie algebra of P. Then there exists a unique subset Π_P of Π, the base of simple roots associated to this choice of positive roots, such that $\{\mathfrak{b}, \mathfrak{g}_{-\alpha}\}_{\alpha \in \Pi_P}$ generates $\mathfrak{p}$. In other words, parabolics containing a single Borel subgroup are classified by subsets of the Dynkin diagram, with the empty set corresponding to the Borel, and the whole graph corresponding to the group G.