# free module

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|---|---|
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Let $R$ be a ring. A *free module* over $R$ is a direct sum of copies of $R$.

Similarly, as an abelian group is simply a module over $\mathbb{Z}$, a *free abelian group* is a direct sum of copies of $\mathbb{Z}$.

This is equivalent to saying that the module has a *free basis*, i.e. a set of elements with the property that every element of the module can be uniquely expressed as an linear combination over $R$ of elements of the free basis.

Every free module is also a projective module, as well as a flat module.