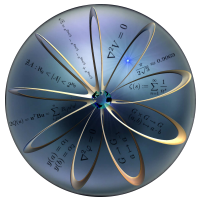

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Tietze transform

Canonical name	TietzeTransform
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Classification	msc 20F10
Defines	elementary Tietze transformation
Defines	general Tietze transform

Tietze transforms are the following four transformations whereby one can transform a presentation of a group into another presentation of the same group:

1. If a relation $W = V$, where W and V are some word in the generators of the group, can be derived from the defining relations of a group, add $W = V$ to the list of relations.

2. If a relation $W = V$ can be derived from the remaining generators, remove $W = V$ fronm the list of relations.

3. If W is a word in the generators and $W = x$, then add x to the list of generators and $W = x$ to the list of relations.

4. If a relation takes the form $W = x$, where x is a generator and W is a word in generators other than x, then remove $W = x$ from the list of relations, replace all occurences of x in the remaining relations by W and remove x from the list of generators.

Note that transforms 1 and 2 are inverse to each other and likewise 3 and 4 are inverses. More generally, the term "Tietze transform" referes to a transform which can be expressed as the compositon of a finite number of the four transforms listed above. By way of contrast, the term "*elementary Tietze transformation*" is used to denote the four transformations given above and the term "*general Tietze transform*" could be used to indicate a member of the larger class.

Tieze showed that any two presentations of the same finitely presented group differ by a general Tietze transform.