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special linear group

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Given a vector space  $V$ , the special linear group  $\mathrm{SL}(V)$  is defined to be the subgroup of the general linear group  $\mathrm{GL}(V)$  consisting of all invertible linear transformations  $T : V \longrightarrow V$  in  $\mathrm{GL}(V)$  that have determinant 1.

If  $V = \mathbb{F}^n$  for some field  $\mathbb{F}$ , then the group  $\mathrm{SL}(V)$  is often denoted  $\mathrm{SL}(n, \mathbb{F})$  or  $\mathrm{SL}_n(\mathbb{F})$ , and if one identifies each linear transformation with its matrix with respect to the standard basis, then  $\mathrm{SL}(n, \mathbb{F})$  consists of all  $n \times n$  matrices with entries in  $\mathbb{F}$  that have determinant 1.