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group scheme

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A *group scheme* is a group object in the category of schemes. Similarly, if S is a scheme, a *group scheme over S* is a group object in the category of schemes over S .

As usual with schemes, the points of a group scheme are not the whole story. For example, a group scheme may have only one point over its field of definition and yet not be trivial. The points of the underlying topological space do not form a group under the obvious choice for a group law.

We can view a group scheme G as a “group machine”: given a ring R , the set of R -points of G forms a group. If S is a scheme that is not affine, we can nevertheless interpret G as a family of groups fibred over S .