论文

TRANSFORMATION THEOREMS AMONG CAYLEY-KLEIN GEOMETRIES

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摘要　　A theorem of transformation between two geometries is proved on the basis of Wu's method of mechanical theorem proving. By using this theorem for Cayley-Klein geometries of dimension two, we prove that the nine Cayley-Klein geometries can be divided into three groups within which the geometries are mutually equivalent in the sense that certain geometry statements are correct inone geometry if and only if they are correct in the other geometries of the same group. This means that for each group we only need to choose a model geometry to study and the theorems of other geometries in the same group can be obtained from the model geometry automatically. The three model geometries chosen forthe nine Cayley-Klein geometries are: Euclidean geometry, Riemann geometry, and Galilean geometry.

关键词　　Wu's method,meta theorem,Cayley-Klein ge

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Abstract A theorem of transformation between two geometries is proved on the basis of Wu's method of mechanical theorem proving. By using this theorem for Cayley-Klein geometries of dimension two, we prove that the nine Cayley-Klein geometries can be divided into three groups within which the geometries are mutually equivalent in the sense that certain geometry statements are correct inone geometry if and only if they are correct in the other geometries of the same group. This means that for each group we only need to choose a model geometry to study and the theorems of other geometries in the same group can be obtained from the model geometry automatically. The three model geometries chosen forthe nine Cayley-Klein geometries are: Euclidean geometry, Riemann geometry, and Galilean geometry.

Key words Wu's method   meta theorem   Cayley-Klein geometry   transformation theorems

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