

# Group classification of differential equations

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## **Abstract:**

Many differential equations which model real-world phenomena of engineering and physical sciences often involve arbitrary elements (parameters or functions). In practice these arbitrary elements are determined experimentally. However, it may happen that the same result is achieved by assuming that the arbitrary element is such that the underlying differential equation admits an additional symmetry group. This is referred to as the problem of group classification of differential equations. Conventionally the process for solving a group classification problem comprises the derivation of the equivalence group which is then exploited to simplify the classifying equations and hence, stipulate the arbitrary elements. The purpose of this talk is to unveil, through examples, the concrete methods accessible for Lie group classification of differential equations.

**Keywords:** Differential equations; group classification; equivalence group

**General area of research:** Mathematics