

## SAW Seminar History of Science, History of text

### Abstract

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Arithmetic operations as generalisation tool: Dedekind's approach

Solving cubic equations by a formula that involves only the elementary operations of sum, product, and exponentiation of the coefficients is one of the greatest results in 16th century mathematics. This was achieved by Girolamo Cardano's *Ars Magna* in 1545.

Still, a deep, substantial difference between the quadratic and the cubic formula exists: while the quadratic formula only involves imaginary numbers when all the solutions are imaginary too, it may happen that the cubic formula contains imaginary numbers, even when the three solutions are anyway all real (and different).

This means that a scholar of the time could stumble upon numerical cubic equations of which he already knew three (real) solutions and the cubic formula of which actually contains square roots of negative numbers.

This will be lately called the "casus irreducibilis". Cardano's *De Regula Aliza* (Basel, 1570) is (at least, partially) meant to try to overcome the problem entailed by it. Its (partial) analysis is the heart of this dissertation.

