

The teaching of “indirect methods” by Gabriel Lamé,
from the École polytechnique of Paris to the Institut of Saint Petersburg (1818-1831)

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Gabriel Lamé had not yet graduated from the École polytechnique when he wrote his *Examen des différentes méthodes employées pour résoudre les problèmes de géométrie* in 1818, which was the result of private lessons he gave to candidates for this school. In this textbook he insisted on the visualisation of equations, the choice of notations and the symmetry of algebraic writings. He thus introduced what would be called the method of abridged notation, which would later appear in secondary education. He emphasised the constant harmony of algebra and geometry and the use of “indirect methods”, such as mechanics. Lamé found the opportunity to implement his conceptions when he is sent as professor of mathematics, from 1820 to 1831, at the Institut des voies de communication of Saint Petersburg, an engineering school modelled on the École polytechnique. With Émile Clapeyron, who had arrived at the Institut with him to teach mechanics, they decided to forge a common teaching. We will examine some of the methods taught by the pair to solve classical problems for students who, according to them, were more at ease with geometry than with analytical calculation. They also provide a method for solving new kinds of problem, like the least-distances problem. These methods were published in Saint Petersburg and then in France, where they were quickly noticed and used.

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