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Malin Karlsson: The Development of Vector Analysis, Differential Geometry and de Rham Cohomology

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Sammanfattning

Beginning with the discovery of Gauss's Theorema Egregium, the steps taken through the history of differential geometry are traced. The process of creating a calculus of vectors is followed as well. The theory of differential forms is compared to that of vector analysis, with illustrations of how the former can present a shorter and simpler way of doing calculations. From the differential forms, the path of differential geometry continues towards de Rham's theorems. This is a starting point for de Rham cohomology, which in three dimensions can be expressed either with vectors or differential forms.