

# Colourings, Polynomials and Roots

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## **Abstract**

A lot has happened since graph colourings first arose as an applied problem in cartography—do four colours always suffice to distinguish countries when colouring a map? Along the way to the proof, the related enumeration function to count the number of  $k$ -colourings was proposed. While the latter didn't help much in the quest for the Four Colour Theorem, it did lead to a fascinating branch of graph theory, namely chromatic polynomials. While polynomials are the simplest of functions, their properties can take you deep within mathematics. In this talk I will describe some recent results on chromatic polynomials and their offshoots, connecting to commutative algebra as well as real and complex analysis. And on our trip, we visit with some old friends, including Charles Hermite, Jacques Sturm, and Carl Gauss.

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