Roots of the chromatic polynomial, spanning trees, and minors

Thomas Perrett

Technical University of Denmark

The *chromatic polynomial* $P(G,t)$ of a graph G is a polynomial with integer coefficients which counts, for each non-negative integer t, the number of proper t-colourings of G. A real number t is called a *chromatic root* of G if $P(G,t) = 0$. It is known that the intervals $(-\infty, 0)$, $(0, 1)$, and $(1, 32/27]$ contain no chromatic roots of any graph, but that chromatic roots are dense everywhere else. The graphs known to have chromatic roots close to $32/27$ have a very precise structure, so that one may extend the zero-free interval $(1, 32/27]$ for restricted families of graphs. In this context we discuss some recent results involving spanning trees and minors.