

Exactly m -coloured graphs

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(joint work with Teeradej Kittipassorn)

Given an edge-colouring of a graph with a set of m colours, we say that the graph is exactly m -coloured if each of the colours is used. If we are given an edge-colouring of the complete graph on the natural numbers with infinitely many colours, for which numbers n can one always find an exactly m -coloured complete subgraph? Stacey and Weidl asked this question in 1999, noting that the injective colouring leaves only numbers of the form $n(n-1)/2$ as potential candidates. Teeradej Kittipassorn and I answered this question recently; we proved that whenever the complete graph on the natural numbers is coloured with infinitely many colours, there is a complete $(n(n-1)/2)$ -coloured subgraph for every natural number n . In this talk, I will talk about this theorem and various other related questions and results.