VCU Discrete Mathematics Seminar

Remarks on the fractional chromatic number of a graph

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Wednesday, Oct. 28
1:00-1:50 (US Eastern)

Zoom! @ `https://vcu.zoom.us/j/92975799914`
`password=graphs2357`

Given a graph G and $\mathcal{I}$, the family of independent sets of vertices in G, we say a function $f : \mathcal{I} \to [0, \infty)$ is a fractional coloring if for each vertex v, $1 \leqslant \sum_{v \in I} f(I)$ the inequality holds. Further, the weight of f, denoted $w(f)$, is defined to be $\sum_{I \in \mathcal{I}} f(I)$. The fractional chromatic number, $\chi_f(G)$, is the minimum weight of all fractional colorings. This extends the notion of chromatic number as when f is restricted to integer values, this is the traditional chromatic number. We develop methods for producing bounds on $\chi_f(G)$. In doing so, we show simple proofs for theorems similar to Grotzch's Theorem for 3-colorability and the five color theorem for planar graphs.

(Photo credit: Allison Blanchard).

For the DM seminar schedule, see:

`https://www.people.vcu.edu/~nobushaw/dms.html`