Theorem[subsection] [proposition]Proposition [corollary]Corollary [lemma]Lemma [remark]Remark [problem]Problem [ex]Example [definition]Definition

Graph theory

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1 Some references

- *Linear algebra and matrices : topics for a second course* Shapiro, Helene, 1954- Providence, Rhode Island : American Mathematical Society, 2015

2 statements

- Hall's Marriage Theorem (the link is to the mathlib proof of this)
- formalize [Shapiro 2015] Theorem 15.6 entries in m-th power of adjacency matrix count "walks of length m"
- graphs and eigenvalues of adjacency matrix formalize [Shapiro 2015] Theorem 15.10 - for a graph of diameter d, adjacency matrix has at least d+1 distinct eigenvalues
- Handshaking Lemma:

  In any undirected graph, the sum of the degrees of all vertices is equal to twice the number of edges.
- Euler's Theorem:

  A connected graph can be traversed in a single path (an Eulerian path) that visits every edge exactly once if and only if it has exactly zero or two vertices of odd degree. If all vertices have even degree, the path can start and end at the same vertex (an Eulerian circuit).