MA111: Contemporary mathematics

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Entrance Slip (due 5 min past the hour):

- What is the degree of a vertex?
- Is there a graph with 3 vertices, each of which has degree 1?

Today we recap the main points of the chapter

Context: glow puzzle mastery

- Glow puzzle is a fun version of real problem

- Glow puzzle was solved by Euler, Fluery, and Hierholzer

- Euler: count the edges at each vertex

  The total is even, so any odds have to come in pairs

  Each pair of odds is a start/stop

  No pairs: Euler circuit

  1 pair: Euler path

  More pairs: have to "Eulerize"

- Fleury: Don't disconnect the graph

- Hierholzer: Just join the circles

Activity: Glow puzzle design

- (1) Design a moderately hard glow puzzle

- (2) Have a neighbor try it

- (3) If they get it too fast, make a harder one.

- (4) If it is hard, but doable, come put it on the board.
  Sign your name.

- As people put them on the board, practice writing down the puzzle.

Fast: Main points

- Graphs are relationships (edges) between things (vertices)

- Euler circuits "get" all edges and are used in econ, civ e, and bio.

- Euler: count the edges at each vertex

- Fleury: don't disconnect

- Hierholzer: join the partial circuits

- Eulerize: if Euler says too many odds, double edges on a path between the start/stops in each pair

Assignment and exit slip

- Read 5.1 - 5.7

- Be ready to put practice exam problems on the board Friday

- Be working on your glow puzzle level; due two weeks from when the assignment is posted to blackboard

- **Exit slip:** Find an (optimal) Eulerization of these graphs: