

## Final Exam Topics

- All topics on midterm review slides, plus:
- Divide & conquer
  - Recurrences
  - Polynomial multiplication (Karatsuba)
  - Matrix multiplication (Strassen)
- Graphs
  - Representation (edge list/adjacency matrix)
  - Breadth/depth first search
  - Articulation points & biconnected components

## Final Topics (cont.)

- P vs NP
  - Definition of NP - hints and verifiers
  - Example problems from slides & assigned reading
    - SAT, VertexCover, knapsack, quadratic Diophantine equations, clique, independent set, TSP, Hamilton cycle
  - $P \subseteq NP \subseteq Exp$
  - Definition of reduction,
  - $SAT \leq_p VertexCover$  example
  - Definition of NP-completeness
  - Backtrack search