Things that you should know for the final exam

Everything from review sheets one and two. Also:

Graph theory

- Graph theory basic definitions: vertices, edges, arcs, weighted graph, directed graph, cycle, path, tree, spanning tree, bipartite graph, vertex cover and vertex cover number, matching and matching number, fractional vertex cover and fractional matching.
- Algorithm to find a shortest path between two vertices.
- Algorithm to find a minimum spanning tree.
- Augmenting path algorithm to find the maximum slow from source to sink in a graph.
- Max flow/min cut theorem.
- Solving the minimum cost flow problem using the network simplex method.

Integer programming

- Basic definitions: Integer program, binary integer program, mixed integer program, LP relaxation.
- Formulating more general constraints using BIP: either/or constraints, K out of N constraints, domain restricted to a set constraints, fixed charge functions.
- Why can't we solve the LP relaxation and round to a "close" integer solution?
- Branch and bound algorithm.
- Preprocessing techniques to speed branch and bound algorithm (cutting planes, tightening constraints, removing variables, redundant constraints, problem infeasible).