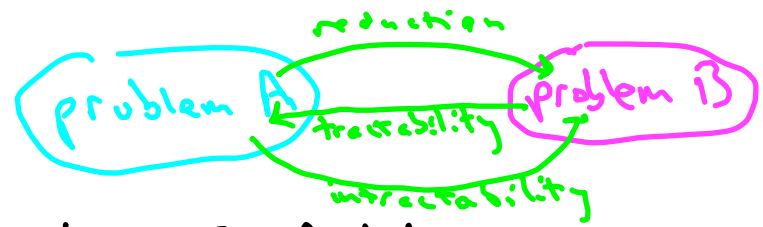


Section 22.3: The Big Picture

(A = knapsack)
(B = MIP)

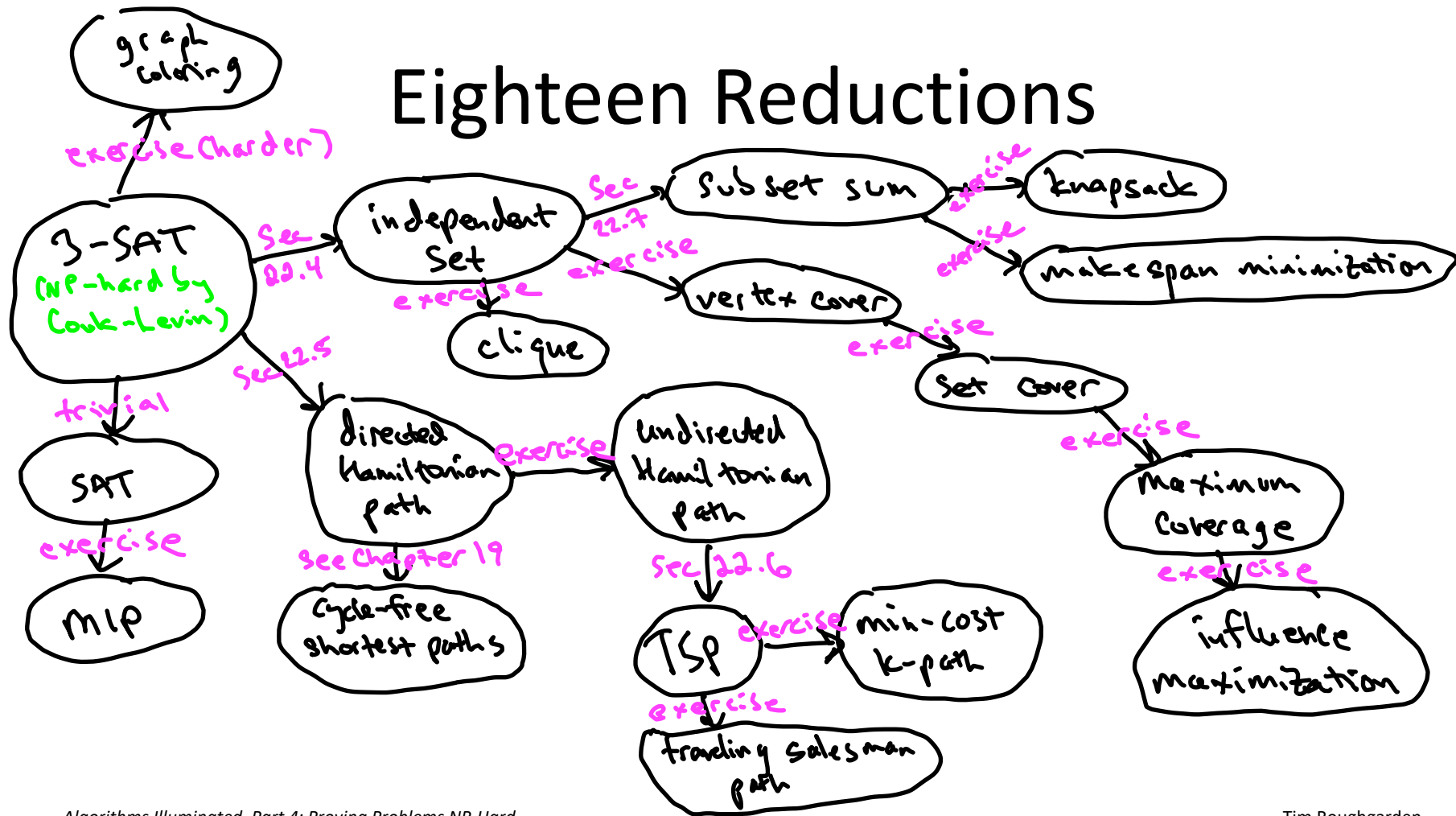
Quiz



The knapsack problem reduces to the mixed integer programming (MIP) problem. What does this imply? (choose all that apply)

- (a) If the MIP problem is NP-hard, so is the knapsack problem.
- (b) If the knapsack problem is NP-hard, so is the MIP problem.
- (c) A semi-reliable MIP solver can be used to give a semi-reliable algorithm for the knapsack problem.
- (d) A semi-reliable algorithm for the knapsack problem can be used to give a semi-reliable MIP solver.

Eighteen Reductions



Goals for the Next Four Videos

- ① Fulfill previous promises that various problems are NP-hard.
- ② Learn NP-hard problems you can use in your own reductions. [see Garey & Johnson book for 300+]
- ③ Know that you could prove a problem NP-hard if you really had to.