

Last name _____

First name _____

LARSON—MATH 556—CLASSROOM WORKSHEET 22
König's Line Coloring Theorem

Review

- What is the *maximum degree* Δ of a graph?
- What is a *regular* graph?
- What is a *valid* (or *proper*) *line coloring* of a graph? What is χ_e ?
- What is König's Line Coloring Theorem?
- What is an example of a Δ -coloring of a bipartite graph?

Questions

1. How can we *prove* König's Line Coloring Theorem?

2. Why does a regular bipartite graph have a perfect matching?

3. Lovasz and Plummer claim that, given any bipartite graph G with maximum degree Δ there is a Δ -regular bipartite graph H where G is a subgraph of H . Why is that true?

4. Prove König's Line Coloring Theorem.

Network Flows

5. What is a *directed graph*?

6. What is a *source* in a directed graph?

7. What is a *sink* in a directed graph?

8. What is a *capacity* in a directed graph?

9. What is a *network*?

10. What is a *flow* in a network?