Last name _____

First name _____

LARSON—MATH 756—CLASSROOM WORKSHEET 22
Knuth—Sandwich Theorem

Review

1. What is Knuth's definition of ϑ_1?
2. Can we find ϑ_1 for the path P_3?
3. Why does $\vartheta \leq \vartheta_1$ for any graph?
4. What is a *feasible* matrix for a graph G?
5. What is a *feasible* matrix for the path P_3?
6. What can we say about feasible matrices?
7. What is Knuth's definition of ϑ_2?
8. Can we find ϑ_2 for P_3?

New

1. What is the main idea of the proof that $\vartheta_1 \leq \vartheta_2$?

2. If A is a symmetric matrix with largest eigenvalue λ, what are the eigenvalues of $B = \lambda I - A$? (Why is B a *semidefinite* matrix?)

3. Show: $\vartheta_1 \leq \vartheta_2$ for any graph.

4. Illustrate the ideas of the proof to the path graph P_3. Argue that $\vartheta_1(P_3) \leq \vartheta_2(P_3)$.