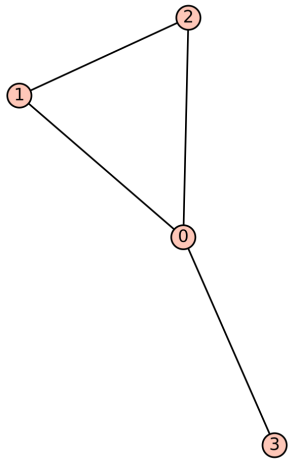
Last name _____

First name _____

LARSON—OPER 731—HOMEWORK WORKSHEET h02
Linear Programming—Integer Programming



1. What is a *vertex packing*? Find a maximum vertex packing in the graph G above.
2. Write an Integer Program (IP) whose optimum is the size (cardinality) of a maximum vertex packing (that is, *model* this graph problem as an integer programming problem.
3. Find an optimum (guess and test).
4. Solve the corresponding LP (the *relaxation*).
5. Explain why the (primal) VPIP optimum is no more (and can be no more) than the VPLP optimum.
6. Find and solve the dual LP.
7. Restrict the decision variables of your dual LP to be integers. Can you give a combinatorial interpretation of this IP?
8. Find the dual optimum (guess and test).
9. Explain why the dual IP optimum is no less (and can be no less) than the dual LP optimum.
10. Give a *combinatorial* interpretation of the dual LP and its optimum.