**LARSON—MATH 556—CLASSROOM WORKSHEET 12**
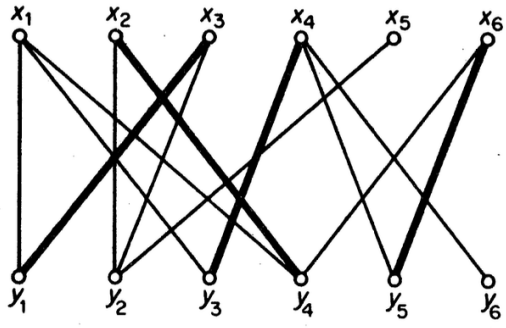**Berge's Theorem and the Hungarian Method**

Concepts & Notation

- *assignment problem, graph G, points $V(G)$, lines $E(G)$, adjacent, incident.*

- *line covering, line covering number ρ, matching, matching number ν, point covering, point covering number τ, independent set, independence number α.*

Review

- **König's Theorem:** For any bipartite graph, $\tau = \nu$.

- Let M be a matching in a graph. What is an *M-alternating path*?

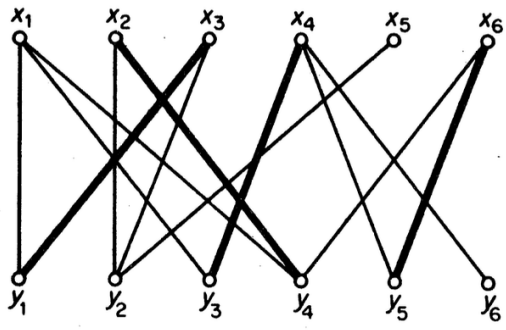- Let M be a matching in a graph. What is an *M-augmenting path*?
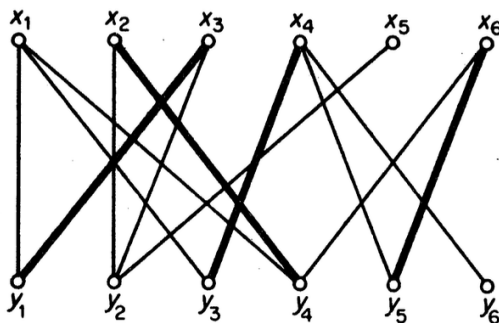
1. Let M be the highlighted lines. Find an M-augmenting path in this graph.
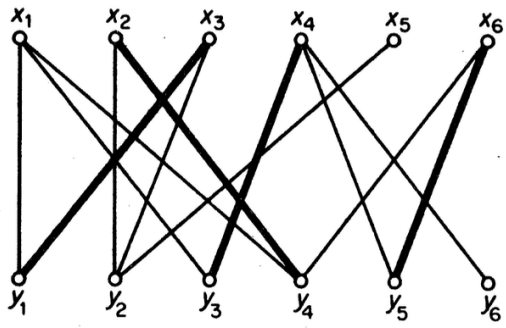
2. What is Berge's Theorem?

3. Why is Berge's Theorem true?

4. What is the *Hungarian Method*?

5. Why does the Hungarian method produce a *provably* maximum matching in a bipartite graph?