Sec. 6.1: k-edge-coloring, proper k-edge-coloring, k-edge-colorable, edge chromatic number $\chi'$, König's Edge Coloring Theorem.

Sec. 6.2: value of a coloring, optimal $k$-coloring, Vizing's Theorem.

Sec. 7.1: covering, covering number $\beta$, independent set, independence number $\alpha$, edge independence number (matching number) $\alpha'$, edge covering, edge covering number $\beta'$, Gallai Identities.

Sec. 8.1: $k$-vertex coloring, proper (vertex) coloring, chromatic number $\chi$, $k$-chromatic-critical graph.

Sec. 8.2: Brooks’ Theorem.

1. Find a maximum independent set of vertices, and $\alpha$.

2. Find a minimum vertex cover, and $\beta$.

3. Check the Gallai identity: $\alpha + \beta = \nu$.

4. Find a maximum independent set of edges, and $\alpha'$.

5. Find a minimum edge vertex cover, and $\beta'$.

6. Check the Gallai identity: $\alpha' + \beta' = \nu$. 
7. Let the above graph be \( G \). List the edges of \( G \).

8. Let \( E(g) \) be the vertex set of a graph \( L(G) \). Draw a dot for each vertex of this new graph and label it.

9. Draw an edge between two vertices of \( L(G) \) if the corresponding edges in \( L(G) \) are incident.

10. Find a maximum independent set of vertices in \( L(G) \). Find \( \alpha(L(G)) \).

11. Check that the corresponding set of edges is independent in \( G \).

12. Find a minimum cover in \( L(G) \). Find \( \beta(L(G)) \). Check that \( \beta(L(G)) = \beta'(G) \).