Recommended practice:

- HHM 1.1.2 pp. 9-10 # 11, 12, 15
- HHM 1.2.1 pp. 20-21 # 1, 2, 6
- HHM 1.2.2. p. 25 # 1, 2, 8
- HHM 1.3.1 pp. 33-34 #1, 2, 4

Assigned questions to hand in:

1. Prove that every closed odd walk in a graph contains an odd cycle.
   
   \[ HHM \ 1.1.2.6 \ \text{p.} \ 10 \]

2. Prove that every 2-connected graph contains at least one cycle.
   
   \[ HHM \ 1.1.2.14 \ \text{p.} \ 10 \]

3. If \( u \) and \( v \) are adjacent vertices in a graph, prove that their eccentricities differ by at most one.
   
   \[ HHM \ 1.2.1.5 \ \text{p.} \ 21 \]

4. If \( A \) is the adjacency matrix for the graph \( G \), show that the \((j,j)\) entry of \( A^2 \) is the degree of \( v_j \).
   
   \[ HHM \ 1.2.2.3 \ \text{p.} \ 25 \]

5. Let \( T \) be a tree of order \( n \geq 2 \). Prove that \( T \) is bipartite.
   
   \[ HHM \ 1.3.1.3 \ \text{p.} \ 17 \]