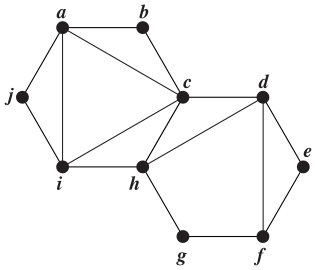
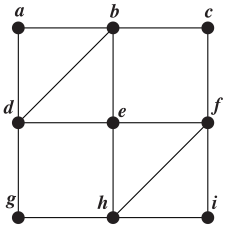
Section 10.5 Homework

1. For each graph below, determine if it has an Euler circuit. If it does, give an example of one. (List the vertices in the circuit.) If it doesn't have an Euler circuit, explain why not using the appropriate theorem.

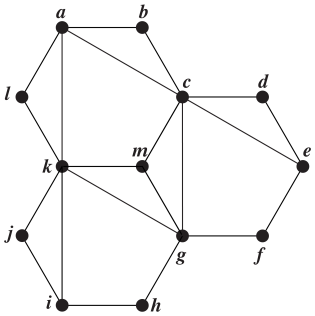
(a)



(b)



(c)



2. For each graph in problem 1, determine if the graph has an Euler path. If it does, give an example of one. (List the vertices in the path.) If it doesn't have an Euler path, explain why not using the appropriate theorem.

3. Suppose that a graph G has an Euler circuit, and suppose that a new edge (which connects vertices already in G) is added to G to form a new graph H. Does the new graph have an Euler path? an Euler circuit? Explain your answers.

Answers:

1. (a) No Euler circuit.
   (b) Euler circuit: $b, d, e, h, f, e, b, c, f, i, h, g, d, a, b$
   (c) No Euler circuit
2. (a) Euler path: $c, b, a, j, i, h, c, i, a, c, d, h, g, f, e, d, f$
   (b) Euler path: Same as the Euler circuit from problem 1(b)
   (c) No Euler path.
3. There will be an Euler path, but no Euler circuit.