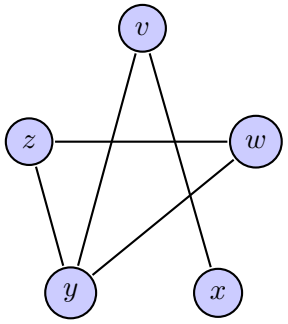
Lesson 20

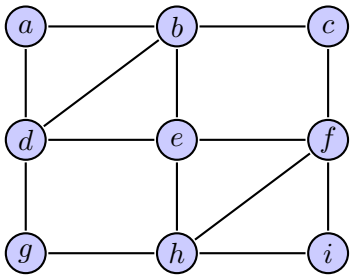
(1) Determine the adjacency matrix and the incidence matrix for the graph below.



(2) For the graph below

(a) Find an Eulerian circuit, or prove that none exists.

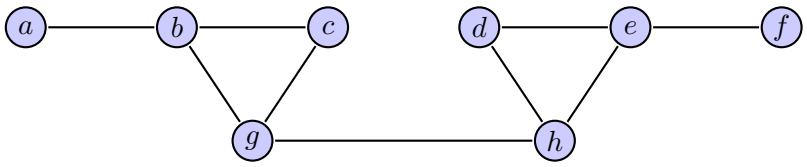
(b) Find a Hamiltonian circuit or prove that none exists.



(3) For the graph below

(a) Determine all the bridges.

(b) Determine all the cutvertices.



(4) For each candidate degree sequence below, either draw a graph with that degree sequence or explain why that list cannot be the degree sequence of a graph.

(a) $4, 4, 4, 4, 4$

(b) $6, 4, 4, 4, 4$

(c) $0, 0, 0, 0, 0$

(d) $3, 2, 1, 1, 1$

(e) $3, 3, 2, 2, 1$

(5) A *forest* is a graph consisting of one or more (separate) trees. If the total number of vertices in a forest is f, and the number of trees in the forest is t, what is the total number of edges in the forest?

(6) (bonus) A tree is called **star-like** if there is exactly one vertex with degree greater than 2. How many different (that it, nonisomorphic) star-like trees are there with six vertices? (Note: If you draw the graph with the vertex of of degree greater than 2 having the *arms* of the tree radiating out from it like spokes on a wheel, the name star-like will make sense.