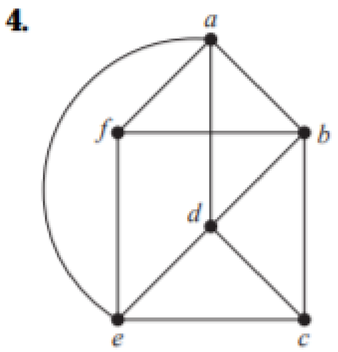
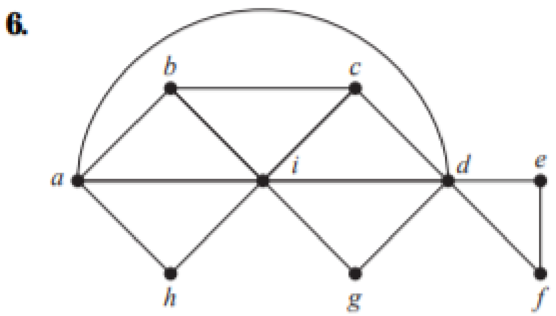
Sec. 10.5

In Exercises 1–8 determine whether the given graph has an Euler circuit. Construct such a circuit when one exists. If no Euler circuit exists, determine whether the graph has an Euler path and construct such a path if one exists.

4. 

c and f have odd degree, so the graph is not Euler circuit but has Euler path.

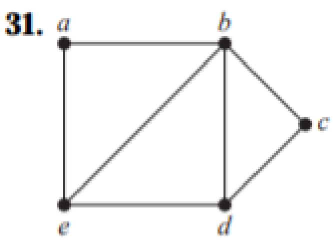
f, a, b, c, d, e, f, b, d, a, e, c.

6. 

b and c have odd degree, so the graph is not Euler circuit but has Euler path.

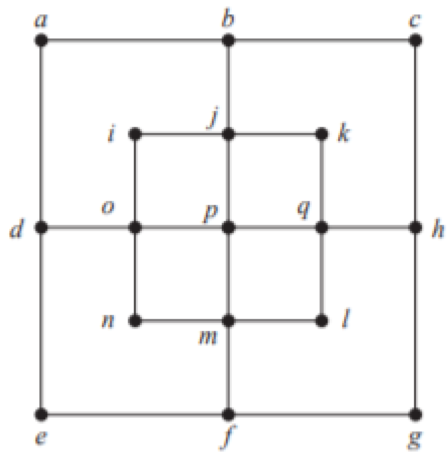
b,a,h,i,c,d,f,e,d,a,i,d,g,i,b,c.

In Exercises 30–36 determine whether the given graph has a Hamilton circuit. If it does, find such a circuit. If it does not, give an argument to show why no such circuit exists.

31. 

abcdea is a Hamilton circuit.

34.

34. 

It doesn't has a Hamilton circuit. If it has, the circuit must have edges ab,bc,ch,hg,gf,fe,ed,da, because acge all have 2 degree only. This is already a circuit without the inside part.

38. Does the graph in Exercise 31 have a Hamilton path? If so, find such a path. If it does not, give an argument to show why no such path exists.

abcde

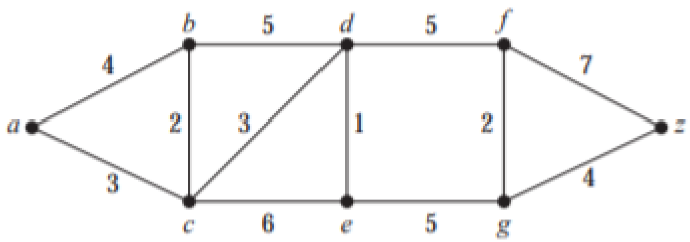
41.Does the graph in Exercise 34 have a Hamilton path? If so, find such a path. If it does not, give an argument to show why no such path exists.

No Hamiton path exists. There are 8 vertices of degree 2 but only two of them can be end vertice of a path. For the rest six vertice, their 2 incident edges must be in the path.

Sec. 10.6

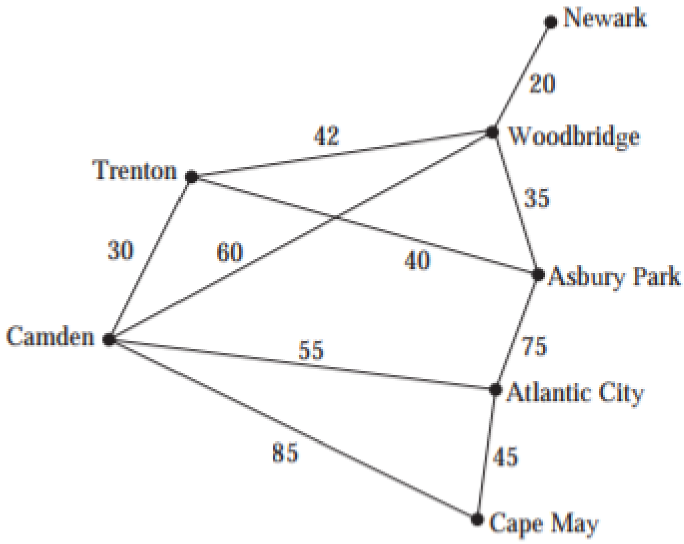
In Exercises 2–4 find the length of a shortest path between a and z in the given weighted graph.

3.

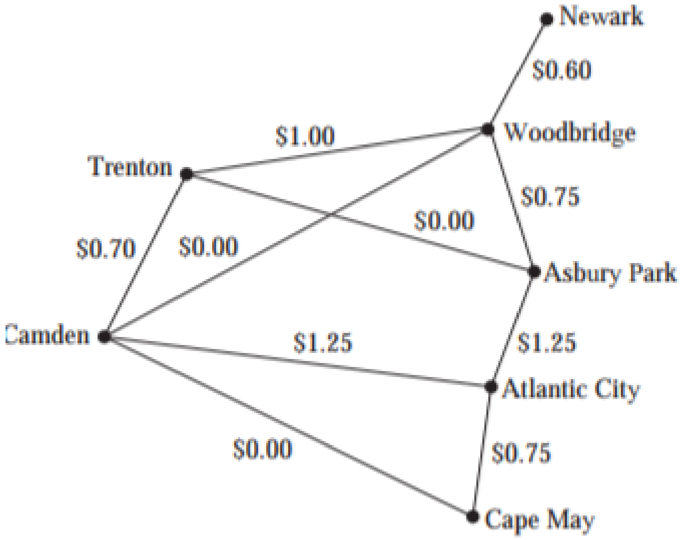
3. 

acdegz

17. The weighted graphs in the figures here show some major roads in New Jersey. Part (a) shows the distances between cities on these roads; part (b) shows the tolls.



(a)



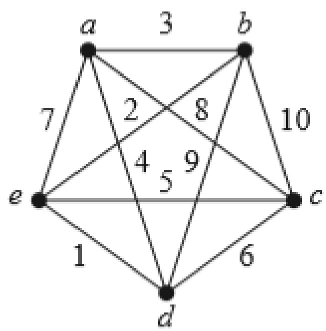
(b)

a) Find a shortest route in distance between Newark and Camden, and between Newark and Cape May, using these roads.

Via Woodbridge

via Woodbridge and Camden

26. Solve the traveling salesperson problem for this graph by finding the total weight of all Hamilton circuits and determining a circuit with minimum total weight.



Circuit	Weight
a-b-c-d-e-a	3+10+6+1+7 = 27
a-b-c-e-d-a	3+10+5+1+4 = 23
a-b-d-c-e-a	3+9+6+5+7 = 30
a-b-d-e-c-a	3+9+1+5+8 = 26
a-b-e-c-d-a	3+2+5+6+4 = 20
a-b-e-d-c-a	3+2+1+6+8 = 20
a-c-b-d-e-a	8+10+9+1+7 = 35
a-c-b-e-d-a	8+10+2+1+4 = 25
a-c-d-b-e-a	8+6+9+2+7 = 32
a-c-e-b-d-a	8+5+2+9+4 = 28
a-d-b-c-e-a	4+9+10+5+7 = 35
a-d-c-b-e-a	4+6+10+2+7 = 29

the circuits a-b-e-c-d-a and a-b-e-d-c-a have the minimal total weight 20.