Steven Murr

HW 10.5

Problems = { 1,2,5,6,10,13,15,26,30,31,39,40}

1) 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 a path if one exists.
**See attached sheet.
10) Can someone cross all the bridges shown in this map exactly once and return to the starting point?
**See attached sheet.

13) In exercises 13-15 determine whether the picture shown can be drawn with a pencil in a continuous motion without lifting the pencil or retracing part of the picture.

26) For which values of n do these graphs have a Euler circuit?

a) K_n

When n is ≥ 2 the graph is a Euler circuit if all vertices have an even degree. This is confirmed by theorem 1.

C_n

When n is ≥ 3 all cycles with be/have an Eulerian Circuit. Every vertex has a degree of 2 in a cycle and therefore all vertices are even.

W_n

Wheels can't have Eulerian Circuits but they are capable of having Eulerian Path's. All vertices have odd degrees.

Q_n

When n is 2, Q_n is a square and all vertices have degree 2. In Q_n when n is 3, all vertices have degree 3. It then makes sense that as n increases all vertices have degree n therefore whenever n is even there will be a Eulerian Circuit and not when n is odd.

30) In Exercises 30-36 determine whether the given graph has a Hamilton circuit.
39) Does the graph in Exercise 32 have a Hamilton path? If so, find such a path. If it does not, give an argument to show why no such path exists.

It does have a Hamilton path. See attached paper.

40) Does the graph in Exercise 33 have a Hamilton path? If so, find such a path. If it doesn't not, give an argument to show why no such path exists.

It does not have a Hamilton Path. See attached paper.