Last name _____

First name _____

LARSON—MATH 356—CLASSROOM WORKSHEET 13
Euler Circuits

Review

- What is *Pascal's Triangle*?
- Why does $\sum_{k=0}^{n} \binom{n}{k} = 2^n$?
- What is the *binomial theorem*?
- What is the *degree* $\rho(v)$ of a vertex v?
- Why does $\sum_{v \in V(G)} \rho(v) = 2|E(G)|$?
- Why does every graph have an even number of vertices with odd degree?

1. What is a *path* in a graph? What is a *connected graph*?

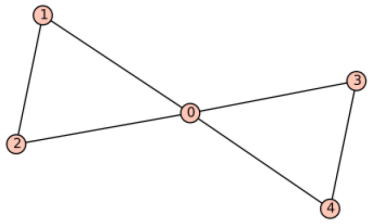
2. What is a *subgraph* of a graph?

3. What is an *induced subgraph* of a graph?

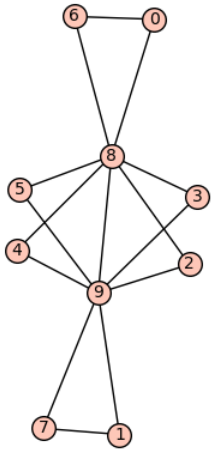
4. What is a *Hamiltonian circuit* in a graph?

5. How can we *find* a Hamiltonian circuit in a graph (if it has one)?

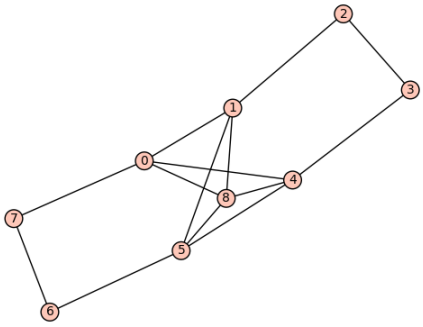
6. What is an *Eulerian circuit* in a graph?



7. Can you find an Eulerian circuit in this graph?



8. Can you find an Eulerian circuit in this graph?



9. Can you find an Eulerian circuit in this graph?

10. (**Claim:**) A connected graph has an Eulerian circuit if and only if every vertex has even degree.