**DAY 2: Hamiltonian Paths and Circuits** Name: \_\_\_\_\_\_\_Key\_\_\_\_\_\_\_\_\_



1. Label the degree of each vertex above. (With labels on graph)
2. Decide if each graph above is a Hamiltonian path. If so, provide an algorithm for that path. If not, explain why not.

1st graph is Hamiltonian: (ABCDEFGHIJ)

2nd graph is not Hamiltonian: there are some vertices of degree 3.

3rd graph is Hamiltonian: (ABCGEFDHB)

1. Decide if each graph above is a Hamiltonian Circuit. If so, provide an algorithm for that circuit. If not, explain why not.

1st graph is not a Hamiltonian Circuit: there are some vertices of degree 1.

 2nd graph is not a Hamiltonian Circuit: must have all degrees of 2 for the vertices

 3rd graph is a Hamiltonian Circuit: (ABCGEFDHB)

1. Are any of the graphs above also Euler paths or Circuit?

Graph 1 is both an Euler Path and an Euler Circuit.

 Graph 2 is an Euler Path but not an Euler Circuit

 Graph 3 is both an Euler Path and an Euler Circuit.

5. What will the degrees of your vertices have to be in order to have one graph which is an

 Euler Path, an Euler Circuit, a Hamiltonian Path, and a Hamiltonian Circuit?

All of the vertices must have a degree of 2.