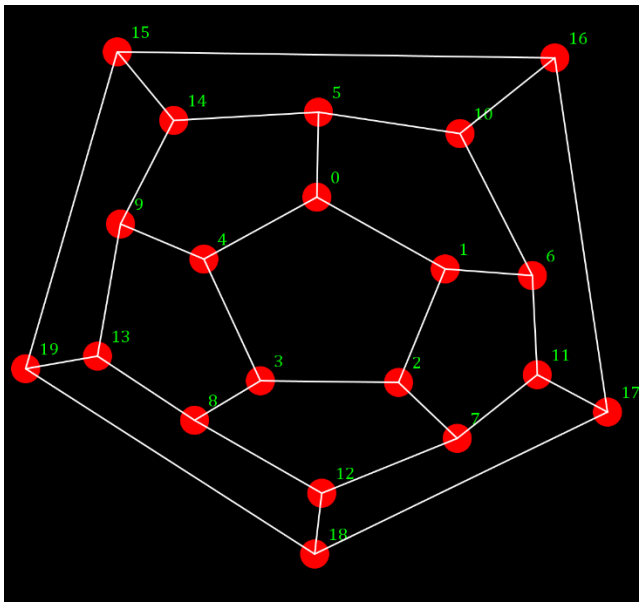
Graph Theory Fall 2020

Assignment 5

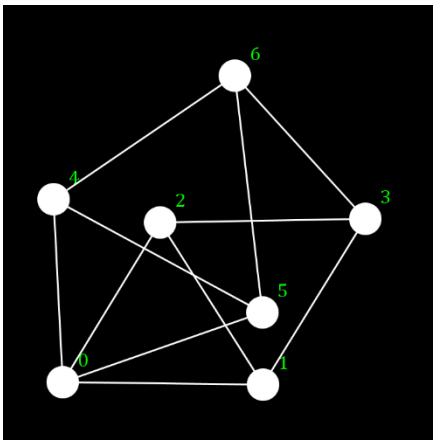
Due at 5:00 pm on Monday, October 12

1. The dodecahedron graph G is depicted below:

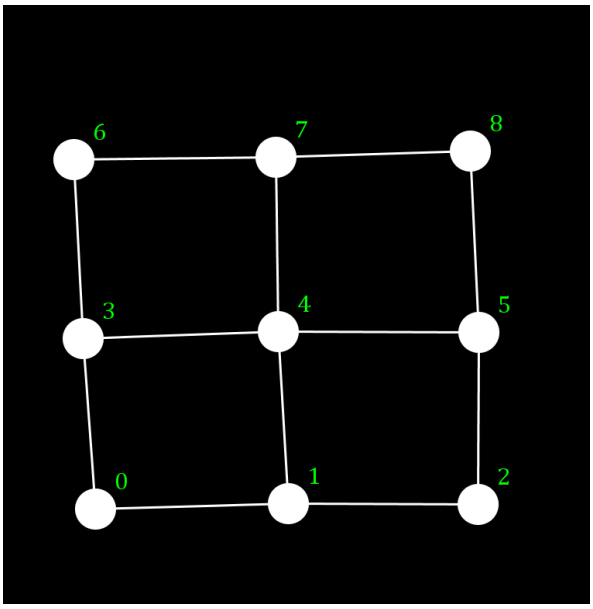


   A. Determine, with justification, whether G is Eulerian.
   B. Show that G is Hamiltonian by finding a Hamilton cycle.

2. Let H be the graph depicted to the right:
   A. Find a 4-coloring of H.
   B. Show that no 3-coloring of H exists.



3. The graph $P_3 \times P_3$ is depicted below. Show that this graph is not Hamiltonian. One approach: Show that any Hamilton path must begin and end at even-numbered vertices. Why does this prevent forming a Hamilton cycle?



4. Find the chromatic polynomial $p_G(k)$of $G = C_6$ and determine whether $k - 2$ is a factor of $p_G(k)$.