Homework #12

question 2

a. $v_1 e_2 v_2 e_3 v_3 e_4 v_4 e_5 v_2 e_2 v_1 e_1 v_0$

- The walk starts from v_1 to v_4 because it has repeated vertices and repeated edges. Hence it is just a walk.

b. $v_2 v_3 v_4 v_5 v_2$

- The walk starts and ends at v_2, contain at least one edge, does not have a repeated edge nor does it have a repeated vertex.
- It is a simple circuit

c. $v_4 v_2 v_3 v_4 v_5 v_2 v_4$

- Seems like a closed walk, when a walk starts and ends at the same vertex and contains a repeated vertex and edge.
- The walk starts and ends at v_4 contains repeated edge, repeated vertices. It is a closed walk.

d. $v_2 v_1 v_5 v_2 v_3 v_4 v_2$

- This walk starts and ends at v_2, contains non-repeated edge, non-repeated vertex
- So, it is a circuit

e. $v_0 v_5 v_2 v_3 v_4 v_2 v_1$

- This walk starts from v_0 and ends at v_5 and has repeated vertex v_2
- So the walk is a trail.

f. $v_5 v_4 v_2 v_1$

- This walk starts from v_5 and ends at v_1 and has no repeated vertex and has no repeated edge.
- The trail is a path.

question 6

a.

$\{v_1, v_3\}, \{v_3, v_2\}, \{v_5, v_3\}$ and $\{v_5, v_3\}$ and $\{v_3, v_4\}$ are bridges. if one of these edges is removed, the graph is disconnected.

b. $\{v_1, v_2\}, \{v_7, v_8\}, \{v_3, v_4\}$ are bridges. If any one of these edges is removed from the graph, the graph is disconnected.

c. $\{v_2, v_3\}, \{v_6, v_7\}, \{v_7, v_8\}, \{v_9, v_{10}\}$ are bridges, and every one of the above edges disconnects the graph if it is removed.

question 7

a

- The graph contains n edges and $n+1$ vertices $\{v_i, v_{i+1}\}$, the removal of any edge in the above graph will disconnect the graph.

b. The graph cannot be disconnected by the removal of any single edge

question 14

- G, the degree of every vertex is an even integer. This graph does in fact contain an Euler circuit.
- one Euler circuit in the graph is iabihbchgedgfdei.

question 43

a.

- W contains two copies of vcw / wcv, W has repeated sections of vcw/wcv in suggesting this there is at least one vertex in W that is repeated.

b.

The contrapositive statement of $p \Rightarrow Q$ is $\sim p \Rightarrow \sim Q$ which are equivalent statements,

question 49

- H is a certain graph, if H is only connected to H then it only has one vertex. If V and W are any two vertices of H then V and W each appear at least once. If there is a circuit in a graph that starts and ends at a vertex V and if W is another vertex in the circuit, then there is a circuit in the graph that starts and ends at W.