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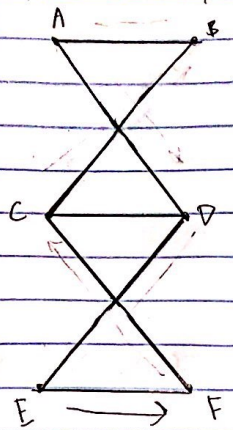
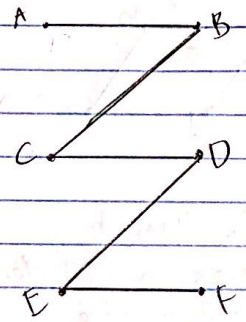
Homework 7

1)



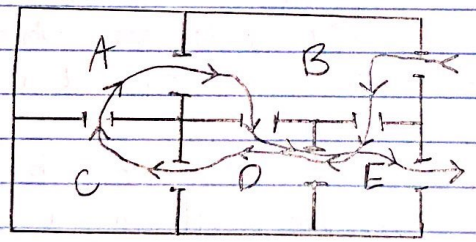
- An Euler circuit starts and ends at the same vertex
- An Euler circuit uses every edge of a graph exactly once.
- An Euler path uses every edge of a graph exactly once as well.
- An Euler path starts and ends at different vertices.

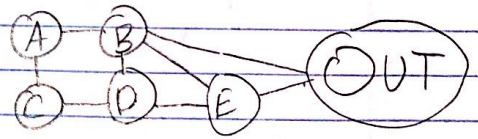


This graph has no Euler circuit, Euler circuit requires all vertices to have even degree.

(C) & (D) are of ODD degree.

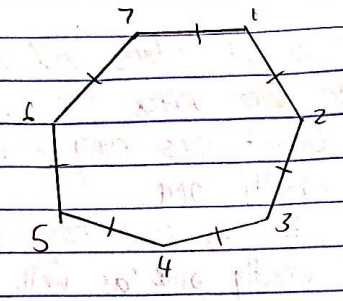
2)





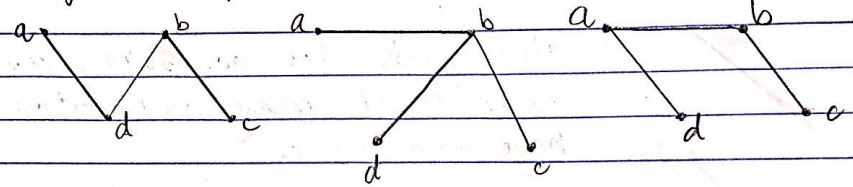
Path to take: OUT → B → E → D → C → A → B → D

3)

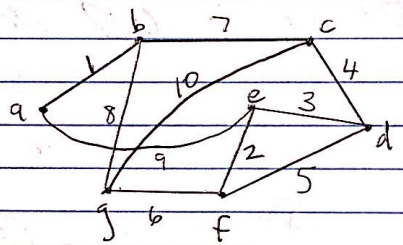


4) Not possible. No loops within a tree. Number of edges is always less than number of nodes.

5)



6)



Kruskal's Algorith:
- List edges in non-decreasing order
- Pick smallest edge
- continue til tree is formed or until v-1 edges where V is vertices and here v = 7.

1 = (a, b)
2 = (e, f)
3 = (e, d)
4 = (c, d)
5 = (d, f)
6 = (g, f)
7 = (b, c)
8 = (b, g)
9 = (a, c)
10 = (g, c)

Can include 1, 2, 3, 4 into tree. 5, however, will result in a cycle, so we exclude 5. Adding edge 6 and edge 7 will also keep our tree with no issues. Hence we have our minimal tree with 6 edges (7-1 = 6).
{1, 2, 3, 4, 6, 7}