CS 173, Fall 17 Examlet 6, Part A

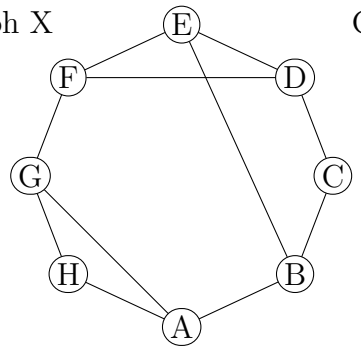
Name:_____

NetID:_____ **Lecture: A B**

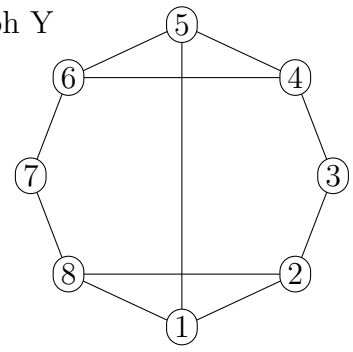
Discussion: Thursday Friday 9 10 11 12 1 2 3 4 5 6

1. (10 points) Are graphs X and Y (below) isomorphic? Justify your answer.

Graph X



Graph Y



2. (5 points) Draw a picture of the graph $K_{2,3}$.

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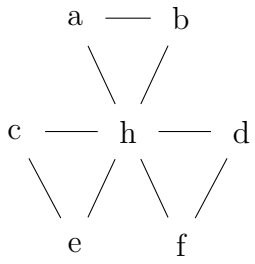
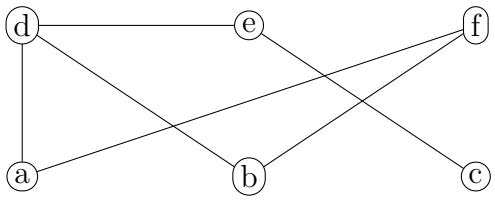
1. (10 points) How many isomorphisms are there from G (below) to itself? Justify your answer and/or show your work clearly .



2. (5 points) Is this graph bipartite? Briefly justify your answer.



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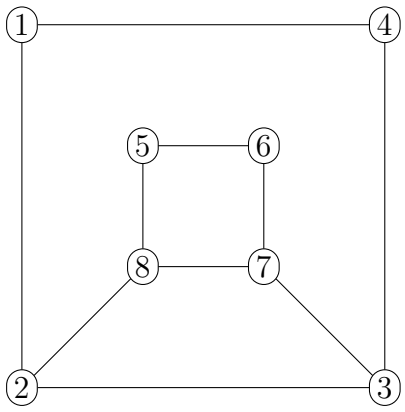
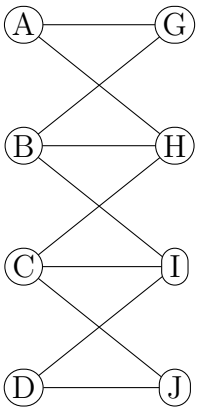
Graph X



Graph Y



2. (5 points) The degree sequence of a graph is the list of the degrees of all the nodes in the graph, arranged in numerical order, largest to smallest. Is it possible to construct a (simple) graph with degree sequence: 4, 3, 3, 2, 0? Show how or briefly explain why this isn't possible.

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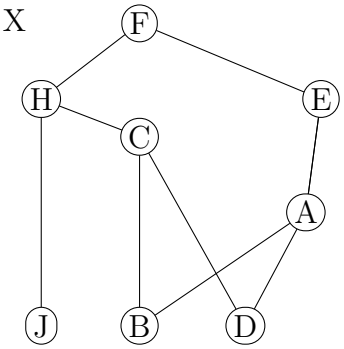
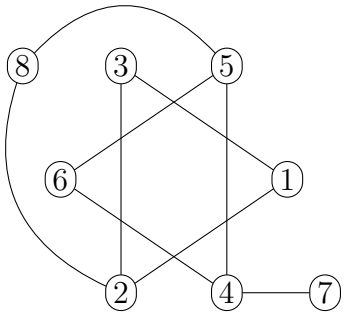
1. (10 points) Are graphs X and Y (below) isomorphic? Justify your answer.

Graph X



Graph Y



2. (5 points) Suppose that $d(u, v)$ is the distance between nodes u and v (i.e. along the shortest path. Agent K claims that $d(u, v) + d(v, w) = d(u, w)$ for any nodes u, v, and w. Is he correct? Briefly explain why or give a counter-example.

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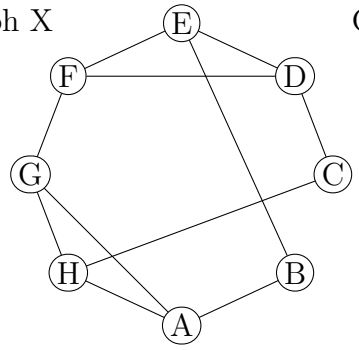
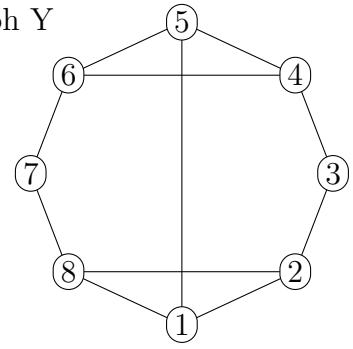
Graph X



Graph Y



2. (5 points) The degree sequence of a graph is the list of the degrees of all the nodes in the graph, arranged in numerical order, largest to smallest. Is it possible to construct a (simple) graph with degree sequence: 4, 3, 3, 2, 2, 1? Show how or briefly explain why this isn't possible.

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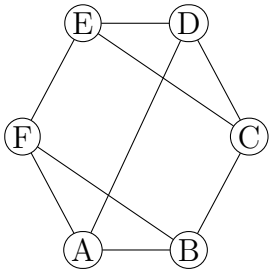
1. (10 points) How many isomorphisms are there from G (below) to itself? Justify your answer and/or show your work clearly .



2. (5 points) How many edges are in the complete bipartite graph $K_{10,5}$?