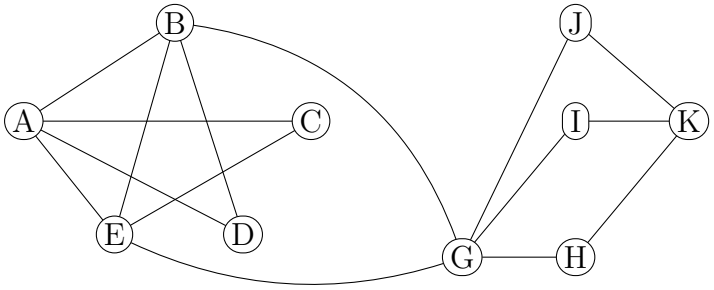
CS 173, Fall 2016
Examlet 6, Part A

NETID:

FIRST:	LAST:

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

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 C_5 a subgraph of W_7? Briefly justify your answer.

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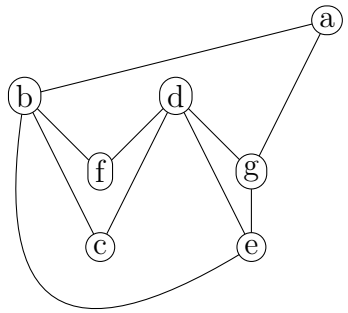
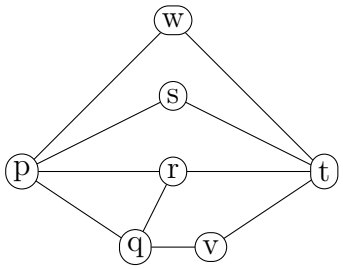
1. (10 points) Are graphs X and Y (below) isomorphic? Justify your answer.

Graph X



Graph Y



2. (5 points) Use the pigeonhole principle to briefly explain why a graph with n nodes ($n \geq 2$) must have two nodes with the same degree. Hint: if one node has degree 0, what is the maximum degree of any other node?

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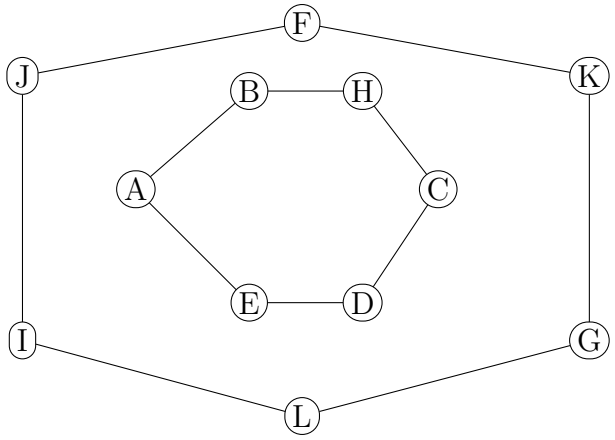
1. (10 points) How many isomorphisms are there from G (below) to itself? Justify your answer and/or show your work clearly .



2. (5 points) The complete graph K_7 contains 7 nodes. How many edges does it have?

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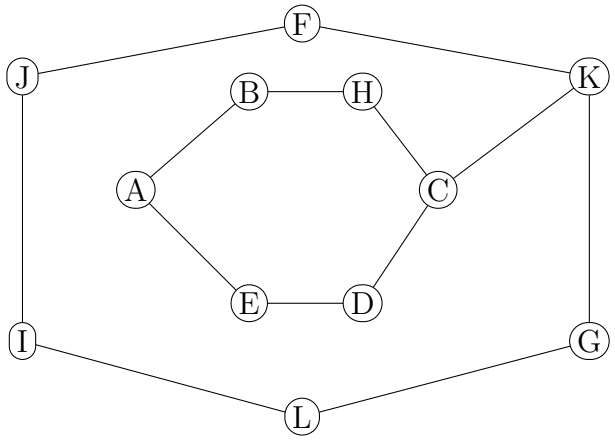

2. (5 points) How many edges are in the complete bipartite graph $K_{11,6}$?

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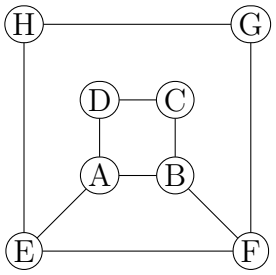
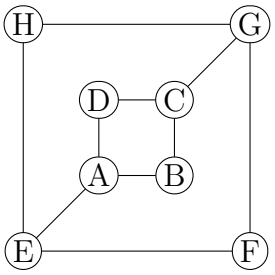
1. (10 points) Are graphs X and Y (below) isomorphic? Justify your answer.

Graph X



Graph Y



2. (5 points) If G is a graph, its complement G' has the same nodes as G but G' has an edge between nodes x and y if and only G does not have an edge between x and y. Give a succinct high-level description of the complement of C_5. Briefly justify or show work.

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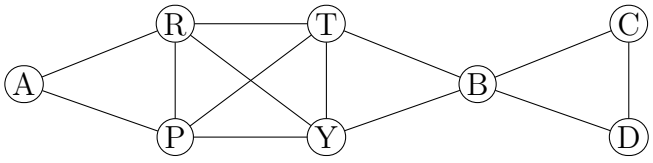
1. (10 points) How many isomorphisms are there from G (below) to itself? Justify your answer and/or show your work clearly .



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