

HOMEWORK 5 (MATH 61, SPRING 2017)

Read: **RJ**, Sec 8.1-3, 8.6 first half page, Ex. 8.6.7, 9.

Solve: **RJ**, Sec 8.2 Ex 11, 12, 14, 15, 30, 32, 35, 36, 48, Sec 8.3 Ex 2, 4, 5, 7, 8, 14, 15, Sec 8.6 Ex 2, 3, 8, 9, 11, 12.

Problem I. Let $G = K_{6,6}$. Find the number of subgraphs of G isomorphic to W , where

- a) $W = P_8$
- b) $W = P_9$
- c) $W = C_8$
- d) $W = C_9$
- e) $W = K_{3,4}$
- f) $W = K_{4,4}$
- g) $W = H_3$, the 3-cube.

Problem II. For each of these sequences, explain why they cannot be scores (degree sequences) of a simple graph.

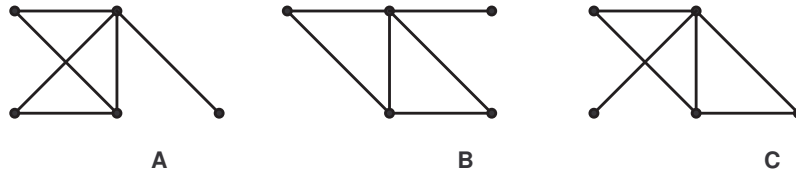
- a) (2,3,3,4,5,6,7)
- b) (0,1,2,3,4,5,6,7)
- c) (3,3,3,5,5,5,5)
- d) (1,2,3,4,4,6,6)
- e) (2,2,2,6,6,6,6)
- f) (2,3,4,5,5,7,7,7)

Problem III. Prove that n -cube H_n has a Hamiltonian cycle, for all $n \geq 2$.

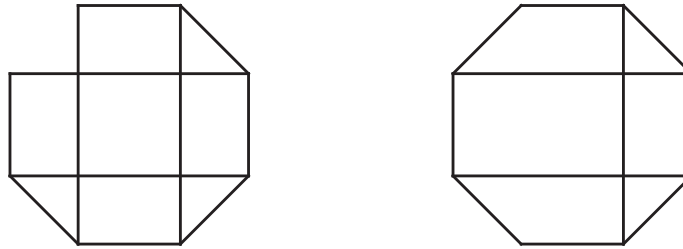
Problem IV. Prove that $K_{n,n}$ has a Hamiltonian cycle, for all $n \geq 2$.

Problem V. Decide whether the following graphs are isomorphic or non-isomorphic.

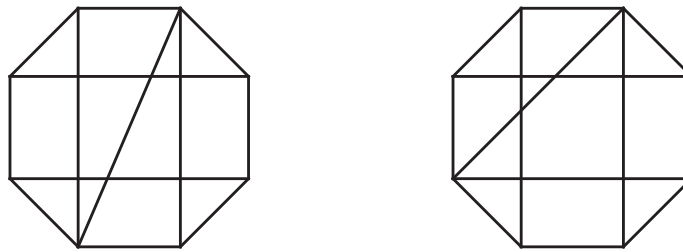
- a)



b)



c)



This Homework is due Wednesday May 17, at 10:59:59 am (right before class). Please read the collaboration policy on the course web page. Make sure you write your name in the beginning and your collaborators' names at the end. Write the answers in ink and box them. Remember that in the proof questions, you also need to provide an explanation exhibiting your logic. In other questions, just the answer suffices.

P.S. Each item above has the same weight.