HOMEWORK 2 (MATH 180, SPRING 2016)

Read: MN (Second ed.), sections 4.3, 4.4

Solve: Exc 14, 15a in $\S4.3$, 7, 8 in $\S4.4$, and the following problems.

I. Use any computer algebra system or website wolframalpha.com to compute the number of walks $1 \rightarrow 3$ of length 37 in graph below. Include printout of your computation.



II. Find the number of walks of length 2n in $K_{n,n}$, from $1 \to 1'$. Same question for paths.

III. Let r = 7. Compute the number of subgraphs of $K_{r,r}$ isomorphic to

- a) P_3
- b) P_5
- c) C_3 d) C_4
- e) C_6
- C U
- f) $K_{3,1}$ g) $K_{3,2}$
- h) $K_{3,3}$
- i) O_9
- j) P_{14}
- k) C₁₄

IV. Find all graphs (up to isomorphism) with score (6, 3, 3, 3, 3, 3, 3). Prove that no other such graphs exist. Same question for graphs with score (3, 3, 3, 3, 3, 3).

VI. Describe all graphs (up to isomorphism) which contain no subgraph isomorphic to P_3 .

This Homework is due Wednesday April 13, at 12:59:59 pm. (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. Box all answers. Remember that answers are not enough, you also need to provide an explanation exhibiting your logic.

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