

## HOMEWORK 6 (MATH 61, SPRING 2017)

**Read:** RJ, Sec 8.4, 8.5, 9.1-4.

**Solve:** RJ, Sec 9.1 Ex. 5, 31, Sec. 9.2 Ex. 16, 23, 24, Sec. 9.3 Ex. 8.

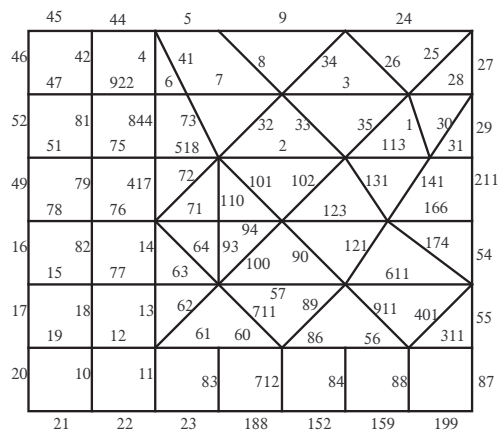
**Problem I.** Find all spanning trees in  $K_{3,2}$ .

**Problem II.** For each of these sequences, either draw a tree with that degree sequence, or explain why they cannot be degree sequences of a tree.

- a) (1,1,2,2,2,2,2)
- b) (1,1,1,2,2,2,2,2)
- c) (1,1,1,2,2,2,2,3)
- d) (1,1,1,1,1,1,1,7)
- e) (1,1,1,1,1,3,3,3)
- f) (1,1,1,1,2,2,2,6)
- g) (1,1,1,1,2,2,3,3)

**Problem III.** Let  $G = K_4 - e$  be a complete graph minus one edge. Use matrices to compute the number of walks  $a \rightarrow a$  of length 310, where  $a$  is a vertex of degree of degree 3. Same when  $a$  is a vertex of degree 2.

**Problem IV.** In the following weighted graph, find the minimal and maximal weight spanning trees.



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This Homework is due Friday June 2, 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.