Mathematical Concepts — Exam 4
MAT 117, Spring 2013 — D. Ivanšić

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Show all your work!

The rules: you may use your book and notes on this take-home exam. Your work is to be entirely your own: you may not talk to anybody else about the exam problems. If you are stuck with something, you may come to see me. Turn the exam in by Monday, May 6th, 3PM.

- 1. (30pts) A class of bored teenagers is trying to decide on what to use as a dare.¹ The choices are "jump from a tree", "drink cow urine", "sit in a restaurant refrigerator in summer clothes", "excavate a yellow jacket nest without a pesticide". Their preference rankings are shown below.
- a) Which choice wins the vote in a plurality election?
- b) Which choice wins the vote in a plurality election with elimination?
- c) Which choice is the pairwise comparison winner?
- d) Which choice is the winner using Borda's method? Perform the check on the sum of Borda points.

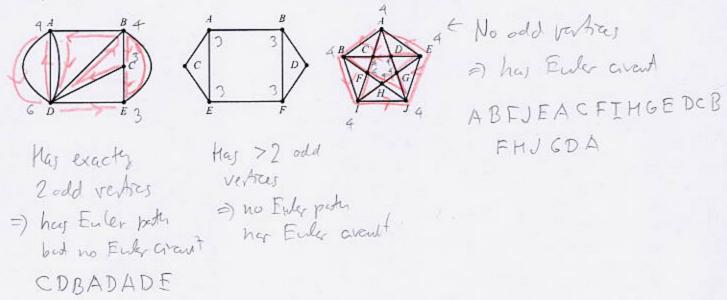
Votes						9	
1st 2nd 3rd	D	D	Е	J	J	S	S
2nd	E	J	S	S	E	D	J
3rd	J	S	D	D	S	J	E
4th	S	Е	J	E	J E S D	Ε	D

d) D
$$4.13+3.9+2.6+|.11=102$$

E $4.4+3.14+2.9+1.18=82$
S $4.10+3.10+2.15+1.4=104$ why
J $4.12+3.6+2.15+1.6=102$
 390
= 39.10

¹Fictional morons. Do not attempt.

(17pts) Determine whether each of the following graphs has an Euler path or an Euler circuit. If it does, find it and state the order in which the vertices are visited, if not, explain why not.

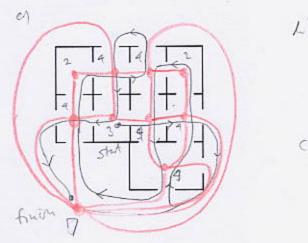


3. (13pts) Below is the floor plan of a house, with doors joining rooms indicated.

a) Represent the floor plan as a graph (rooms are vertices, don't forget an "outside").

b) Use the graph to determine if it is possible to walk around the house, passing through every door exactly once. If it is, draw the route.

c) Is it possible to do the same as in b), and start and finish in the same room?



1) graph has exactly his odd

Vertices =) has an Ewler spather, but no creat

Black line shows route

() No, because an Ewler circuit does not exist