# Homework 7

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**304.2** .

a) Not Eulerian because of the odd number of edges at points 2 and 5.

b) Since there are two points with an odd number of edges, it is possible to do the new walk because the overall sum is positive.

**307.1** .

a) ab, bc, cd, de, ef, fa, ae, bd, df

b) ab, bc, bd

c) b and d

d) 3

e) 9

**320.10** .

First let's look at positions that only one person can play:

Deb must play 5, which means she cannot play 3 or 4.

Gladys must play 4, which means she cannot play 3.

Hermione will then play 3, which means she cannot play 2.

Courtney, Ellen, or Alice can play 2.

Alice, Courtney, or Fay can play 1.

Let's say that: Bonnie(1), Alice(2), Hermione(3), Gladys(4), Deb(5).

If Hermione cannot play 3, there is no assignment that will work, as Gladys and Deb cannot fill 3 positions.

**331.1** .

If we consider some reasonable choices...

a-b-d-g-j = 2-2-2-8 = 14 a-b-d-g-e-h-j = 2-2-2-1-2-4 = 13 a-b-d-g-e-i-j = 2-2-2-1-3-2 = 12

The final path is the shortest possible from the potential paths.

**331.3** .

1:

$$s - x_1 - y_1 - t, flow = 1$$

2:

$$s - x_2 - y_3 - t, flow = 2$$

3:

$$s - x_3 - y_1 - t, s - x_1 - y_1 - t, flow = 2$$

4:

$$s - x_1 - y_2 - t, flow = 3$$

5:

$$s - x_4 - y_3 - t, s - x_2 - y_3 - t, flow = 3$$

6:

$$s - x_2 - y_6 - t, flow = 4$$

**338.4** .

We are maximizing $x_{sa} + x_{sb}$, so the constraints are:

$$x_{sa} \leq 4, x_{sb} \leq 5, x_{ab} \leq 3, x_{ac} \leq 2$$
$$x_{bc} \leq 1, x_{bd} \leq 6, x_{dc} \leq 2, x_{ct} \leq 7, x_{dt} \leq 3$$

with the following flow balance constraits:

$$x_{sa} = x_{ab} + x_{ac}$$
$$x_{sb} + x_{ab} = x_{bc} + x_{bd}$$
$$x_{ac} + x_{bc} + x_{dc} = x_{ct}$$
$$x_{bd} = x_{dc} + x_{dt}$$