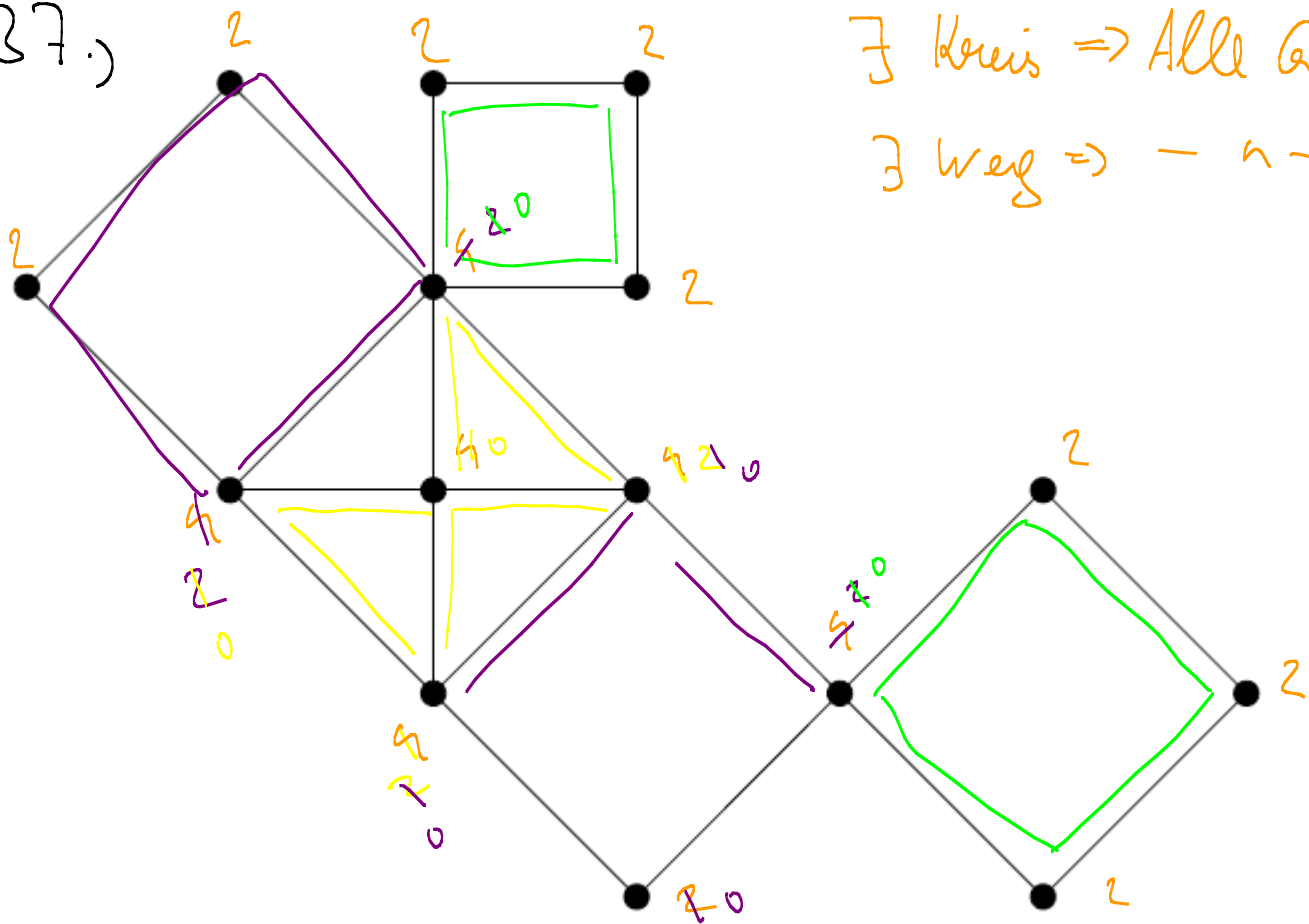


# Diskrete Mathematik Übung 10:

Note Title

17.06.2007

137.)



$\exists$  Kreis  $\Rightarrow$  Alle  $G$  gerade

$\exists$  Weg  $\Rightarrow$  - n -

Z13) E, A, D, S

K, G

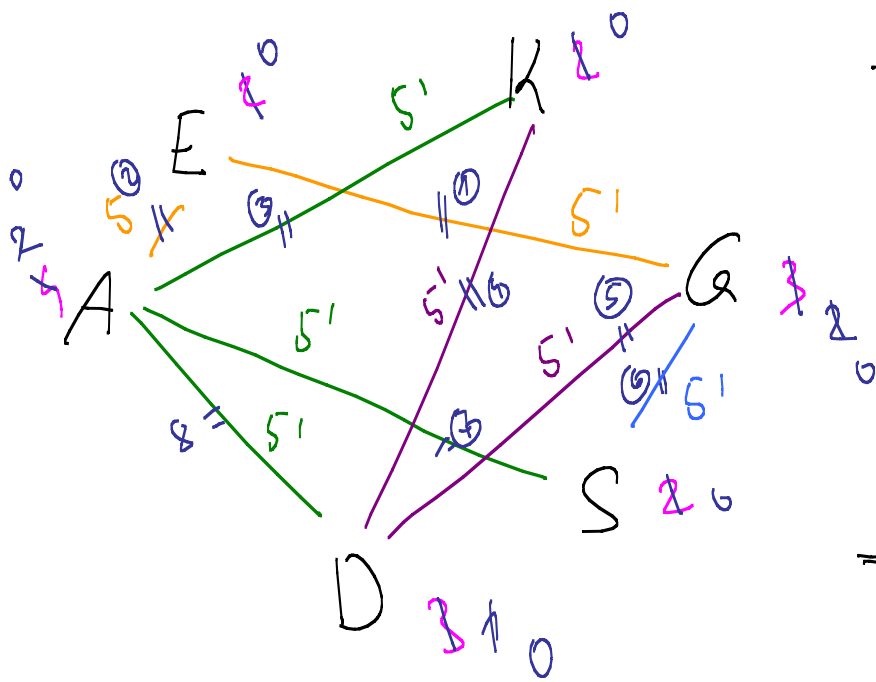
max 2 Peers auf Yacht

✓ E: A, G 2' 5 min

✓ A: D, S, K 2' 5 min

D: K, G 2' 5 min

✓ S: G 2' 5 min



⇒ ∃ Eulerscher Weg

2 x ungerade  
4 x ungerade

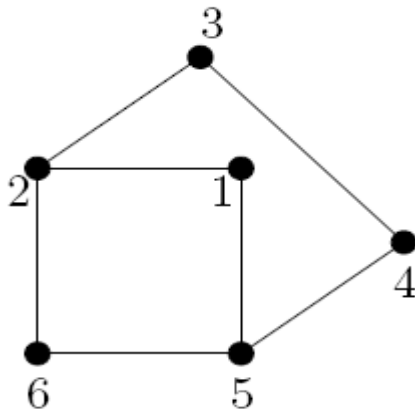
⇒ 8 · 5' = 40'

140)



ist planar  
über TUTTE - Polynome / Algorithmus

142.)



	1	2	3	4	5	6
1	0	1	0	0	1	0
2	1	0	1	0	0	1
3	0	1	0	1	0	0
4	0	0	1	0	1	0
5	1	0	0	1	0	1
6	0	1	0	0	1	0

$$\Rightarrow Q_{2,2}^{(5)}$$

$$W_{2,2}(x) = \sum_{l=0}^{\infty} Q_{2,2}^{(l)} x^l$$

$$W(x) = (I - x \cdot A)^{-1}$$

A =

0	1	0	0	1	0
1	0	1	0	0	1
0	1	0	1	0	0
0	0	1	0	1	0
1	0	0	1	0	1
0	1	0	0	1	0

Code:

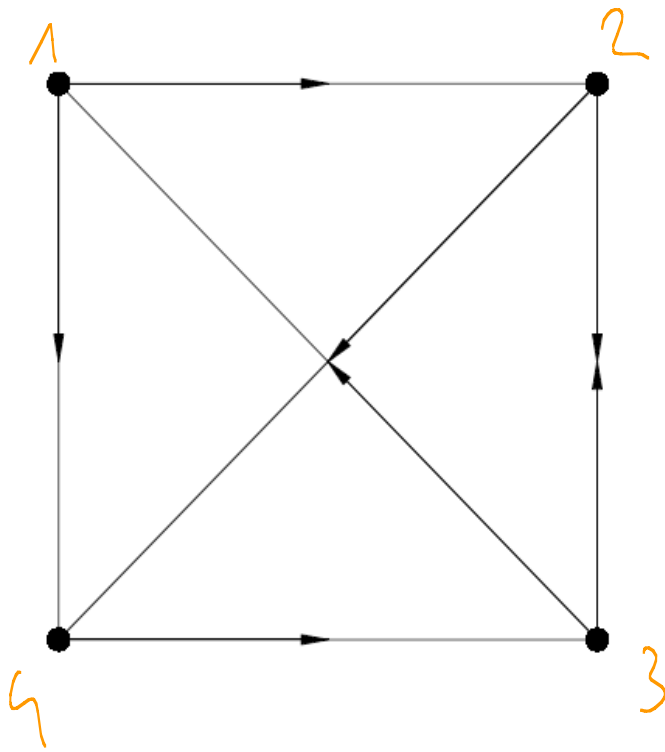
```
clear;
syms x;
datapath = 'matrix_143.txt';
datapath2 = [datapath, '_solve.txt'];
A = load(datapath);
B = A^5;
disp(['#Wege von 2 nach 2: ', num2str(B(2,2))]);
```

B =

2	26	7	7	26	2
26	4	19	14	7	26
7	19	4	12	14	7
7	14	12	4	19	7
26	7	14	19	4	26
2	26	7	7	26	2

#Wege von 2 nach 2: 4

A 143.)



	1	2	3	4
1	0	<del>1</del> 1	<del>1</del> 1	0
2	<del>1</del> 1	0	1	<del>1</del> 1
3	<del>1</del> 1	1	0	<del>1</del> 1
4	1	<del>1</del> 1	<del>1</del> 1	0

A =

```

0 0 1 0
1 0 1 0
0 1 0 1
1 1 0 0
    ^
  
```

B =

```

34 32 45 12
50 61 57 17
44 93 66 45
88 185 80 49
  
```

Cool:

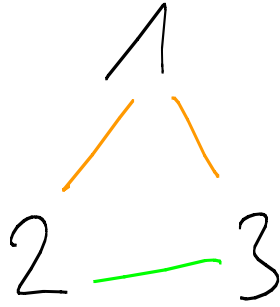
```

clear;
syms x;
datapath = 'matrix_143.txt';
datapath2 = [datapath, '_solve.txt'];
A = load(datapath)
B = A^7
disp(['#Wege von 1 nach 3: ', num2str(B(1,3))]);
  
```

#Wege von 1 nach 3: 45  $\leftarrow$  14

$$144.) V = \{1, 2, 3\}$$

i.)



a.) Matlab:

$$W_{1,1}(x) = (x-1)/(2x^2+x-1)$$

b.) 2 ?

$$1-2-3-1$$

$$1-3-2-1$$

ii.)



a.) Matlab:

$$W_{1,1}(x) = -1/(-1+2x^2+x^3)$$

b.) 1 ?

$$1-2-3-1$$

Matlabcode:

```
clear;
syms x;
datapath = 'matrix_144_2.txt';
datapath2 = [datapath, '_solve.txt'];
A = load(datapath);
I = eye(size(A));
```

```
W_x = (I - x*A)^-1;
W_x(1)
```

$$\frac{-1}{-1+2x^2+x^3}$$

a.)

$$\frac{x-1}{2x^2+x-1}$$

$$x_{1,2} = \frac{-1 \pm \sqrt{1-4 \cdot 2 \cdot (-1)}}{2}$$

$$x_1 = \frac{-4}{2} = -2$$

$$x_2 = \frac{2}{2} = 1$$

$$(2x^2 + x - 1) : (x + 1) = 2x - 1$$

$$\frac{x-2}{2x^2+x-1} = \frac{A}{(2x-1)} + \frac{B}{(x+1)}$$

$$A(x+1) + B(2x-1)$$

	A	B	L
$x^0$	1	-1	-2
$x^1$	1	2	1

$$A - B = -2 \Rightarrow A = B - 2$$

$$A + 2B = 1$$

$$= B - 2 + 2B = 1$$

$$3B = 3 \Rightarrow B = 1$$

$$A = -1$$

$$w_{1,1}(x) = \sum_n^{\infty} (A \lambda_1^n + B \lambda_2^n) x^n$$

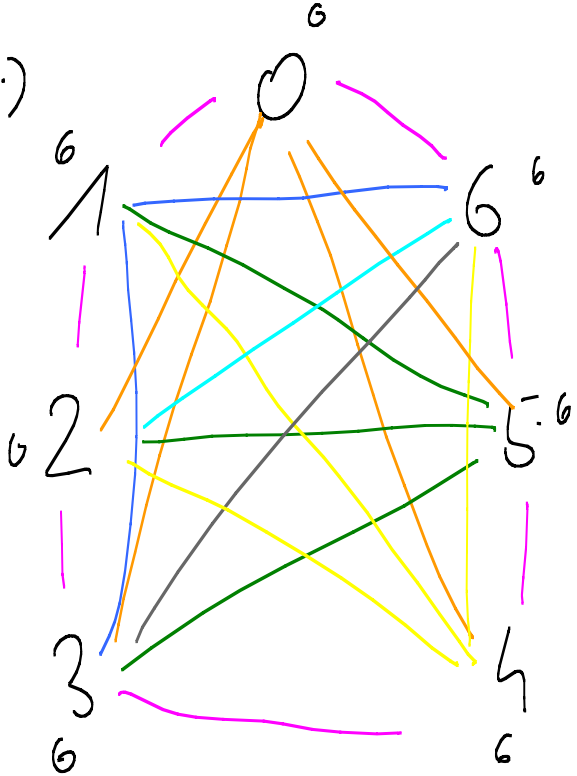
$$\lambda_1 = 2 \quad \lambda_2 = -1$$

$$w_{1,1}^h(x) = \frac{1}{1-\lambda_1 x} \cdot A + \frac{1}{1-\lambda_2 x} B$$

$$= -\frac{1}{1-2} \cdot 1 + \frac{1}{1-(-1)} (-1)$$

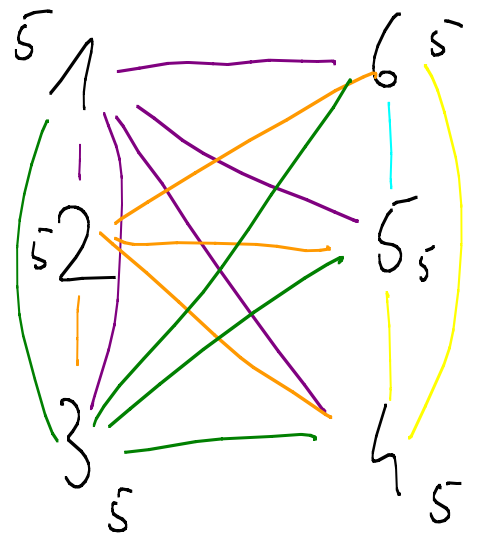
$$= (-1)^h - \left(\frac{1}{2}\right)^h \quad h =$$

138 a.)

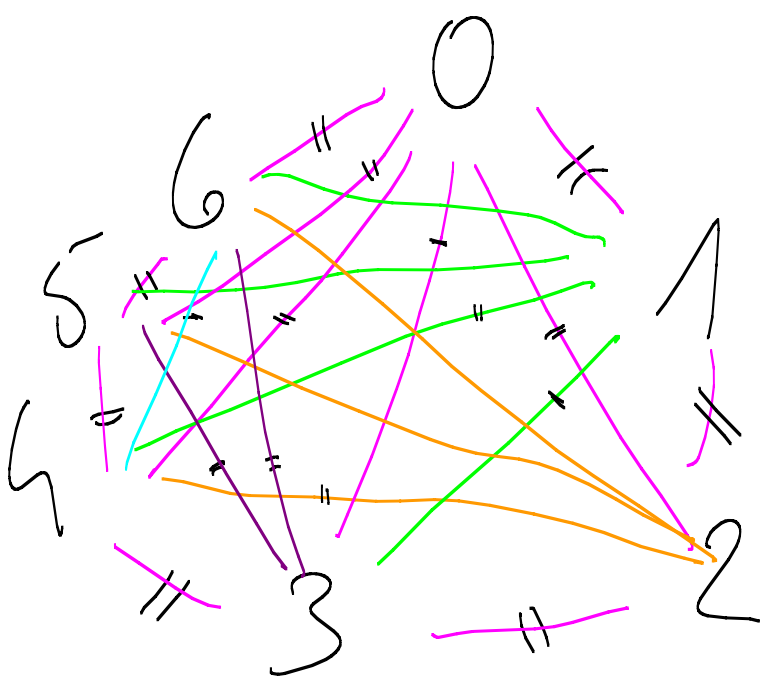


$\Rightarrow \exists$  Euler Kreis

138 b.)



$\Rightarrow \nexists$  Euler Kreis



$$\frac{-1}{-1+2x^2+x^3} =$$

$$1+2x^2+x^3=0 \Rightarrow x_1 =$$