Lektion 11

10.1

$$\begin{cases} x+4+1+2+1 = |E|+1 \\ x\cdot 1+4\cdot 2+1\cdot 3+2\cdot 4+1\cdot 5 = 2|E| \end{cases}$$

$$x+8 = |E|+1$$

$$\underline{x+24 = 2|E|}$$

$$17 = |E| \qquad \underline{x = 10}$$

Antal hörn: ↓ kanter ↓

$$\begin{cases} x+4+1+2+1 = |E|+1 \\ \text{Gradtal:} \\ x\cdot 1+4\cdot 2+1\cdot 3+2\cdot 4+1\cdot 5 = 2|E| \end{cases}$$

(Handskakningsdilemmat)

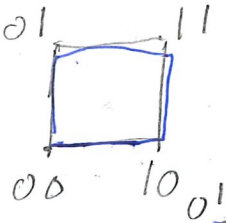
$$\begin{cases} x+8 = |E|+1 \\ x+24 = 2|E| \end{cases} \quad \begin{cases} x+7 = |E| \\ x+24 = 2|E| \end{cases} \quad \begin{cases} x = 10 \\ |E| = 17 \end{cases}$$

SVAR: 17 hörv.

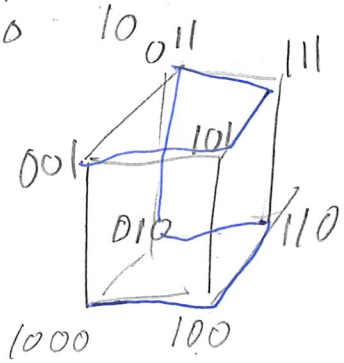
[9.32]

n=1

n=2



n=3



n=1 :

ok

Antag att n=p ger en hamiltoncykel

n=p+1:

P är en hamiltoncykel. Lägger vi till en dimension finns precis en till väg

[9.31]

$$\begin{cases} 2|E(G)| = 3|V(G)| \\ |E(G)| = 2|V(G)| - 6 \end{cases} \qquad \begin{cases} 2E = 3V \Rightarrow E = \frac{3}{2}V \\ E = 2V - 6 \Rightarrow \end{cases}$$

$$\frac{3}{2}V = 2V - 6 \Rightarrow 3V = 4V - 12 \Rightarrow 12 = V, \; E = 18$$

SVAR: $|E(G)| = 18$

$|V(G)| = 12$

[9.4]

$K_n \qquad |E(G)| = 4950 = \frac{n(n-1)}{2} \Rightarrow$

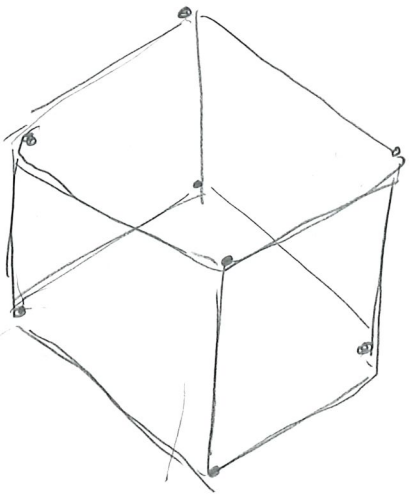
$$9900 = n(n-1) \Rightarrow n^2 - n - 9900 = 0 \Rightarrow$$

$$n = \frac{1}{2} \pm \sqrt{\frac{1}{4} + 9900} = \frac{1}{2} (\pm) \frac{199}{2} = 100 \text{ st}$$

SVAR: 100

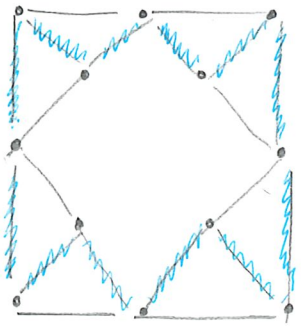
[9.12]

$\frac{120}{10} = 12$ kanter

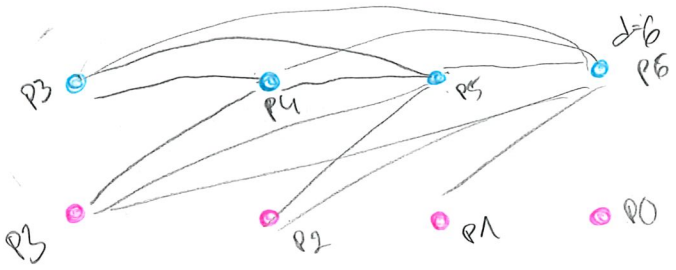


Nej, ty alla hörn har udda grad!

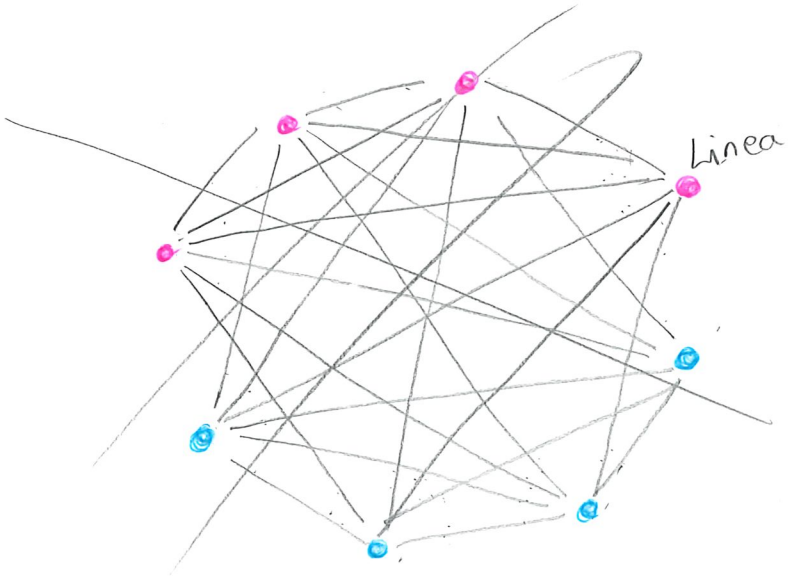
[9.17] Ja:



[9.28]

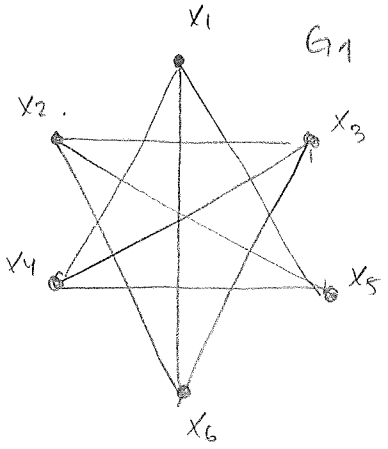


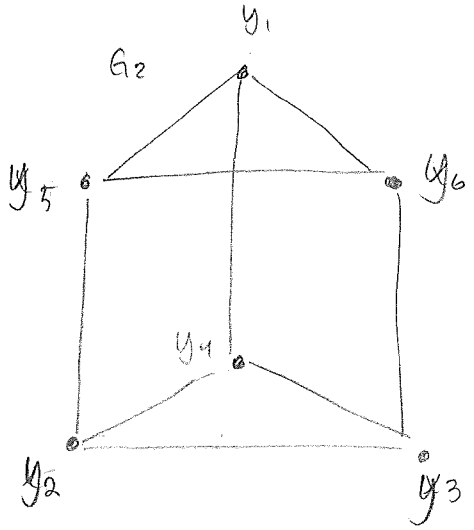
P6 P0
P1 P5
P4 P2



Så: 3 pers var.

[9.9]





$f : V(G_1) \to V(G_2)$

$f(x_1) = y_1, \ldots f(x_6) = y_6$.

$x_1x_4 \in E(G_1)$, $f(x_1)f(x_4) = y_1y_4 \in E(G_2)$

⋮

Detta gäller för alla hörn; JA!

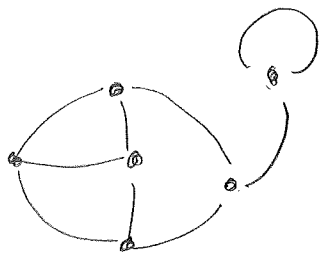
[9.11]

n = udda

$n = 2$

[9.7]

a)



6 st

b) $2|E(G)| = \sum_{v=1}^{N} d_G(v)$

$2 \cdot 15 = \sum_{v=1}^{N} k = N \cdot k \Rightarrow N = \frac{2 \cdot 15}{k} = \frac{2 \cdot 3 \cdot 5}{k} \Rightarrow$

$N = 1, 2, 3, 5, 6, 10, 15$ eller 30 (alla möjliga multiplar av $2 \cdot 3 \cdot 5$)

c) $2|E(G)| = \sum_{v=1}^{2} 4 + \sum_{v=1}^{N} 3 \Rightarrow$

$2 \cdot 10 = 8 + 3N \Rightarrow 3N = 12 \Rightarrow N = 4$

så antal hörn $= 4 + 2 = 6$