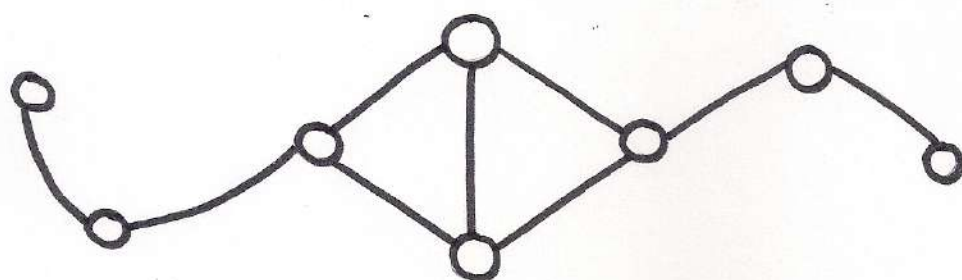


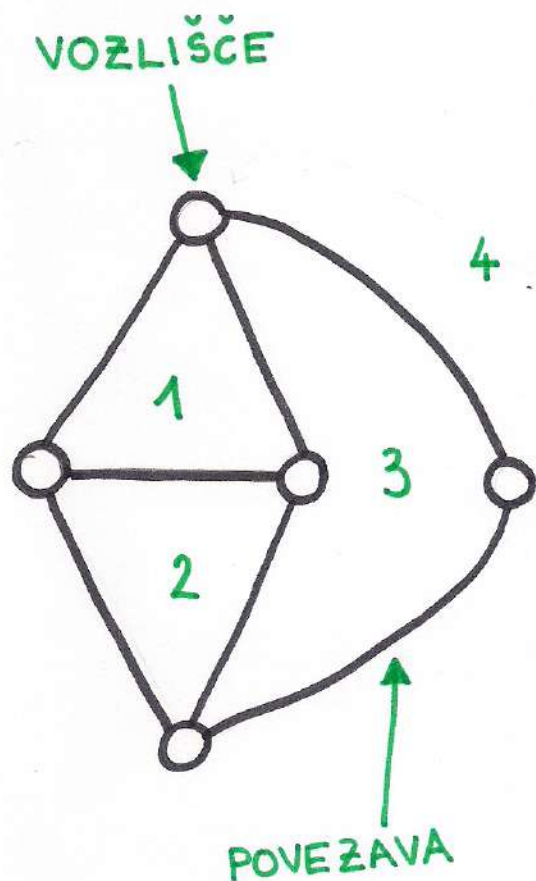
TEORIJA GRAFOV



ZA

OTROKE!

GRAF JE MNOŽICA
VOZLIŠČ, POVEZANIH
S POVEZAVAMI.



TA GRAF IMA
5 VOZLIŠČ
7 POVEZAV
RAVNINO PA
RAZDELI NA
4 DELE

S ŠTEVILKAMI OD 1 DO 4
SO OZNAČENI DELI

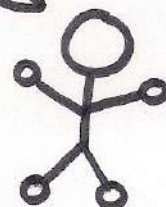
MATEMATIK LEONARD
EULER JE OPAZIL
NEKAJ ZANIMIVEGA,
KO JE IZRAČUNAL:

$$\left(\begin{array}{c} \text{ŠTEVILO} \\ \text{VOZLIŠČ} \end{array} \right) - \left(\begin{array}{c} \text{ŠTEVILO} \\ \text{POVEZAV} \end{array} \right) + \left(\begin{array}{c} \text{ŠTEVILO} \\ \text{DELOV} \end{array} \right)$$

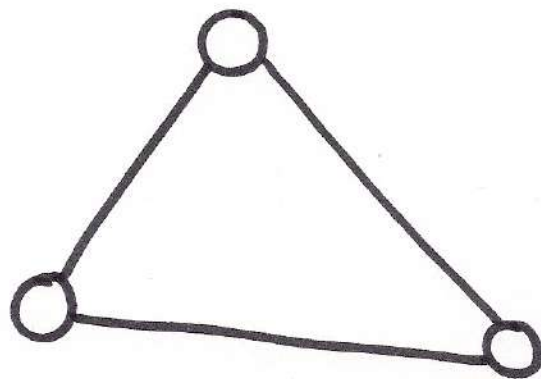
$$V - P + D$$

EULERJEVA KARAKTERISTIKA
JE, DA JE REZULTAT TE
ENAČBE VEDNO ENAK 2.

IZGOVORI SE „OJLER“



IZRAČUNAJ JO!

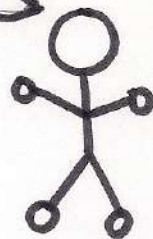


VOZLIŠČA _____

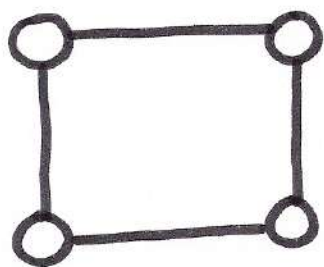
POVEZAVE _____

DELI _____

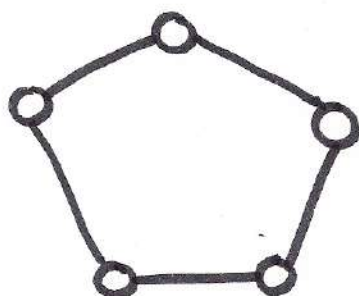
NE POZABI
ŠTETI TUDI
ZUNANJEGA
DELA!



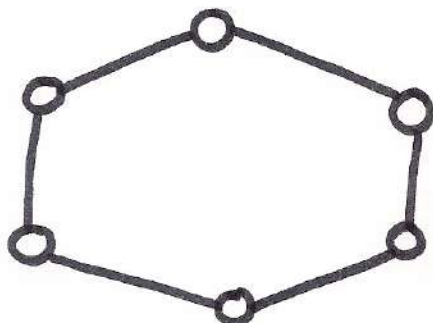
$$\overset{V}{\bigcirc} - \overset{P}{\bigcirc} + \overset{D}{\bigcirc} = \underline{\hspace{2cm}}$$



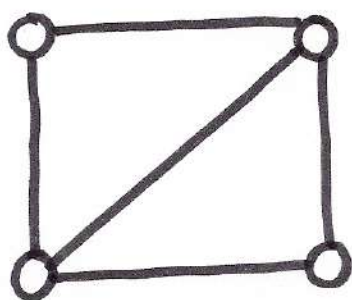
$$\overset{V}{\bigcirc} - \overset{P}{\bigcirc} + \overset{D}{\bigcirc} = \underline{\hspace{2cm}}$$



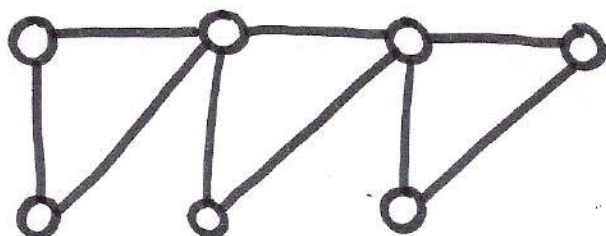
$$\overset{V}{\bigcirc} - \overset{P}{\bigcirc} + \overset{D}{\bigcirc} = \underline{\hspace{2cm}}$$



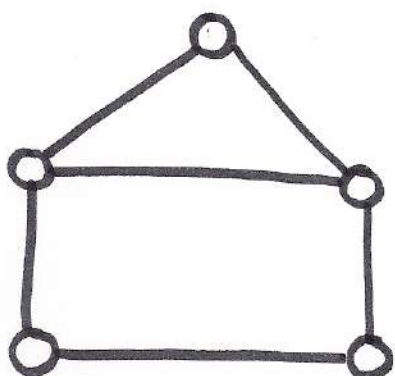
$$\overset{V}{\bigcirc} - \overset{P}{\bigcirc} + \overset{D}{\bigcirc} = \underline{\hspace{2cm}}$$



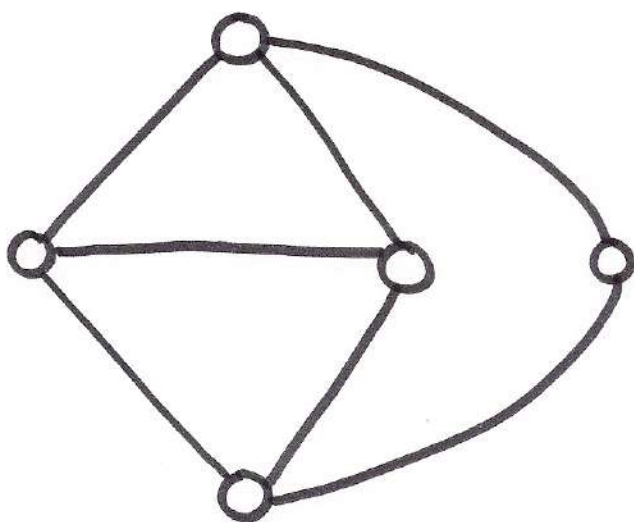
$$\overset{V}{\bigcirc} - \overset{P}{\bigcirc} + \overset{D}{\bigcirc} = \underline{\hspace{2cm}}$$



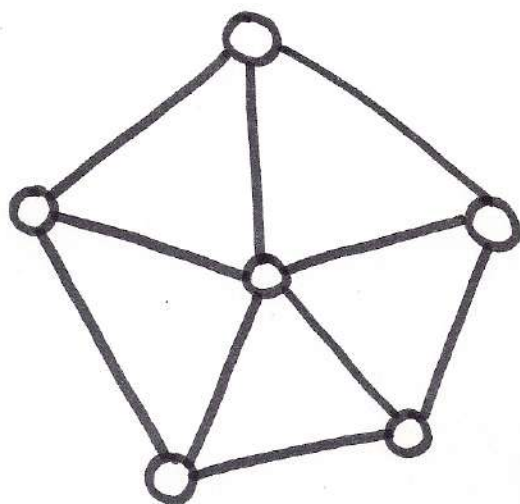
$$\overset{V}{\bigcirc} - \overset{P}{\bigcirc} + \overset{D}{\bigcirc} = \underline{\hspace{2cm}}$$



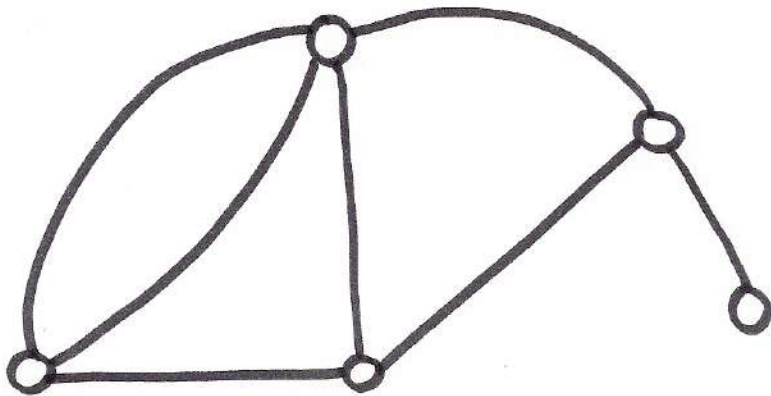
$$\overset{V}{\bigcirc} - \overset{P}{\bigcirc} + \overset{D}{\bigcirc} = \underline{\hspace{2cm}}$$



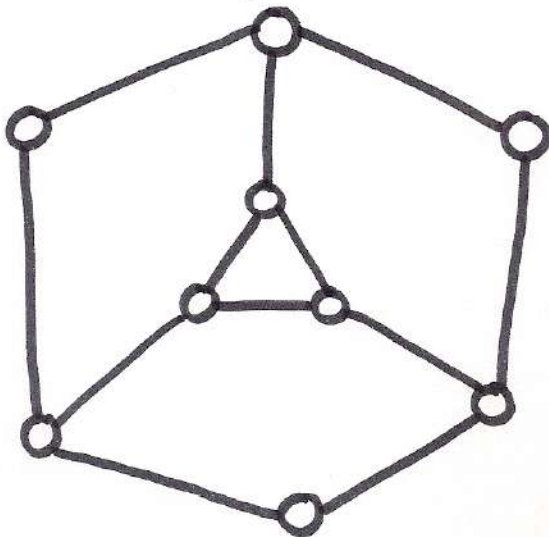
$$\overset{V}{\bigcirc} - \overset{P}{\bigcirc} + \overset{D}{\bigcirc} = \underline{\hspace{1cm}}$$



$$\overset{V}{\bigcirc} - \overset{P}{\bigcirc} + \overset{D}{\bigcirc} = \underline{\hspace{1cm}}$$

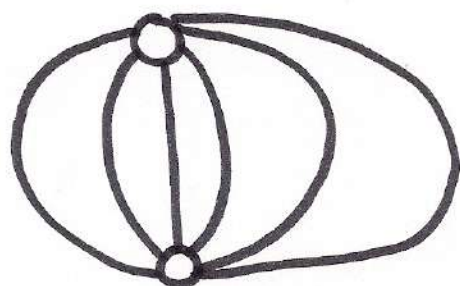


$$\overset{V}{\bigcirc} - \overset{P}{\bigcirc} + \overset{D}{\bigcirc} = \underline{\hspace{1cm}}$$

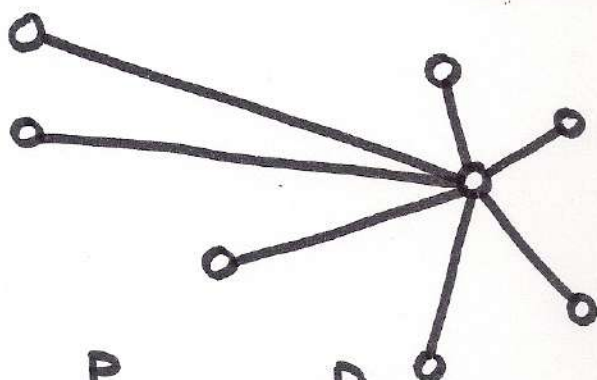


$$\overset{V}{\bigcirc} - \overset{P}{\bigcirc} + \overset{D}{\bigcirc} = \underline{\hspace{1cm}}$$

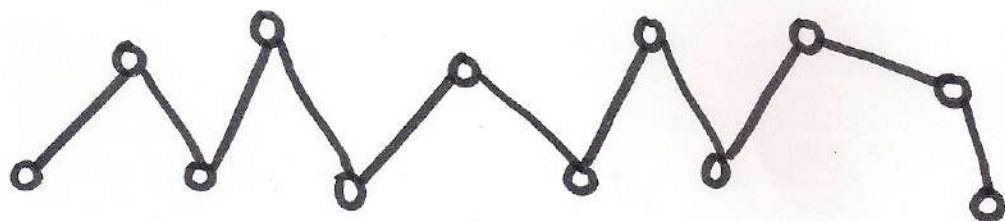
SI VEDNO DOBIL/A 2?
 POSKUSI ŠE NEKAJ
 EKSTREMNIH PRIMEROV:



$$\overset{V}{\bigcirc} - \overset{P}{\bigcirc} + \overset{D}{\bigcirc} = \underline{\hspace{2cm}}$$

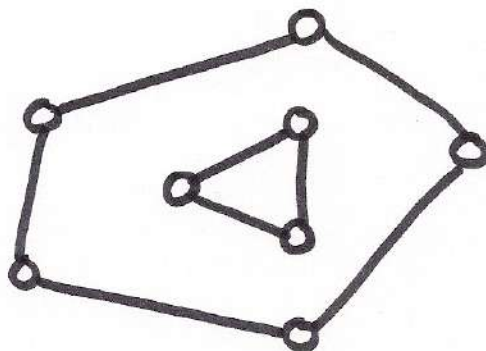


$$\overset{V}{\bigcirc} - \overset{P}{\bigcirc} + \overset{D}{\bigcirc} = \underline{\hspace{2cm}}$$



$$\overset{V}{\bigcirc} - \overset{P}{\bigcirc} + \overset{D}{\bigcirc} = \underline{\hspace{2cm}}$$

POSKUSI ŠE TA GRAF:



$$\overset{V}{\bigcirc} - \overset{P}{\bigcirc} + \overset{D}{\bigcirc} = \underline{\hspace{2cm}}$$

SI DOBIL/A
2? NE?

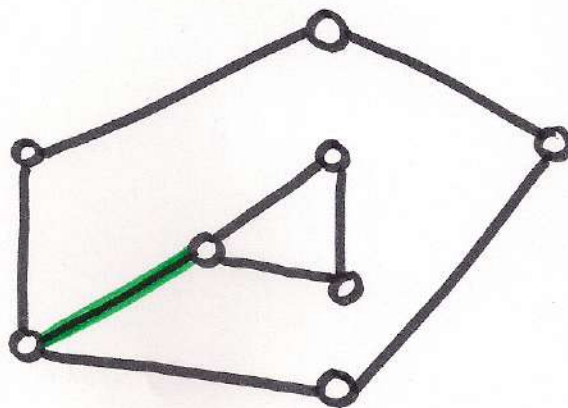


TA GRAF NI POVEŽAN.

GRAF LAHKO POVEŽEMO

TAKO, DA DODAMO

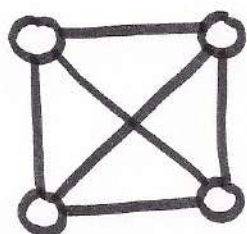
POVEŽAVO.



$$\overset{V}{\bigcirc} - \overset{P}{\bigcirc} + \overset{D}{\bigcirc} = \underline{\hspace{2cm}}$$

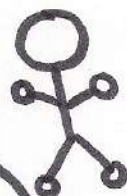
ZDAJ DELUJE!

KAJ PA TA GRAF?



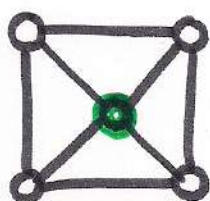
$$\overset{V}{\bigcirc} - \overset{P}{\bigcirc} + \overset{D}{\bigcirc} = \underline{\hspace{2cm}}$$

ALI SI
DOBIL/A 2?



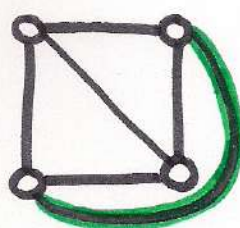
V TEM GRAFU SE DIAGONALNE
POVEZAVE SEKAJO. POSKUSIMO
TO POPRAVITI.

DODAJMO
VOŽLIŠČE



$$\overset{V}{\bigcirc} - \overset{P}{\bigcirc} + \overset{D}{\bigcirc} = \underline{\hspace{2cm}}$$

PREMAKNIMO
POVEZAVO



$$\overset{V}{\bigcirc} - \overset{P}{\bigcirc} + \overset{D}{\bigcirc} = \underline{\hspace{2cm}}$$

ZDAJ DELUJE!

RAVNINSKI GRAF LAHKO
NARIŠEMO TAKO, DA SE
POVEZAVE MED SEBOJ NE SEKAJO.

GRAF POSKUSI NARISATI SAM/A!

MOJ GRAF:

$$\overset{V}{\bigcirc} - \overset{P}{\bigcirc} + \overset{D}{\bigcirc} = \underline{\hspace{2cm}}$$

MOJ GRAF:

$$\overset{V}{\bigcirc} - \overset{P}{\bigcirc} + \overset{D}{\bigcirc} = \underline{\hspace{1cm}}$$

MOJ GRAF:

$$\overset{V}{\bigcirc} - \overset{P}{\bigcirc} + \overset{D}{\bigcirc} = \underline{\hspace{1cm}}$$

ALI JE ZA POVEŽAN
RAVNINSKI GRAF EULERJEVA
KARAKTERISTIKA VEDNO 2?
JA!

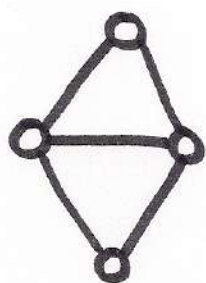
• ZAČNE SE PRAVILNO

○

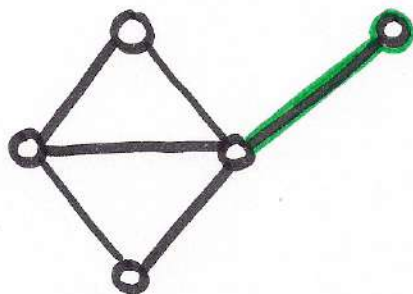
ENO VOZLIŠČE
NI POVEŽAV
EN DEL

$$\overset{V}{\bigcirc} - \overset{P}{\bigcirc} + \overset{D}{\bigcirc} = \underline{\hspace{2cm}}$$

- OSTANE RES, KO GRAFU DODAMO VOZLIŠČE.



PREJ



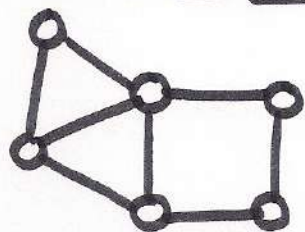
POTEM

ENO NOVO
VOZLIŠČE
ENA NOVA
POVEŽAVA

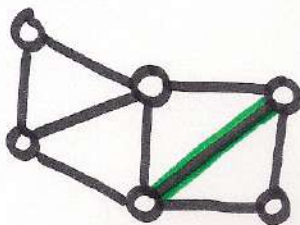
$$V - P + D = \underline{\hspace{2cm}}$$

NA NOVO DODANO VOZLIŠČE IN NJEGOVA POVEŽAVA SE ODŠTEJETA

- OSTANE RES KO DEL PREPOLOVIMO Ž NOVO POVEŽAVO.



PREJ



POTEM

ENA NOVA
POVEŽAVA
EN NOV
DEL

$$V - P + D = \underline{\hspace{2cm}}$$

NOVA POVEŽAVA IN DODATNI DEL SE ODŠTEJETA