TE Maths op : GRAPHES 11/12/2025

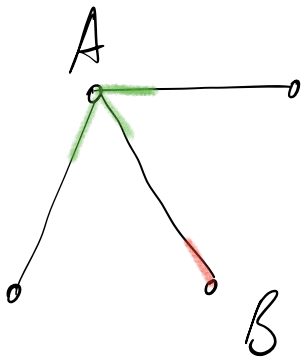
TE Maths : Loi normale
TCL
} 18/12/2025

Listes des exos pour le TE sur les graphes :

3.1.1 à 3.1.2
3.1.5
3.1.10
3.1.12
3.1.13
3.1.17
3.1.19

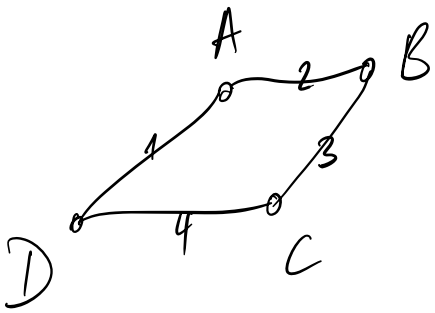
3.2.1
3.2.2 à 3.2.5

3.3.1
3.3.2
3.3.4



$\text{degré}(A) = 3$

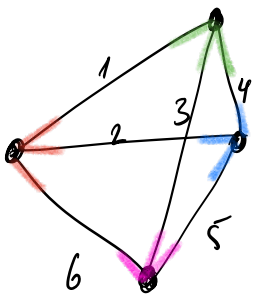
$\text{degré}(B) = 1$



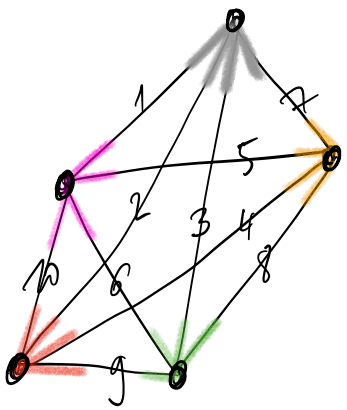
$\deg(A) = \deg(B) = \deg(C) = \deg(D) = 2$

$$\#\text{arêtes} : \frac{\#\text{sommets} \cdot \text{degré constant}}{2} = \frac{4 \cdot 2}{2} = 4$$

chaque arête a été comptée



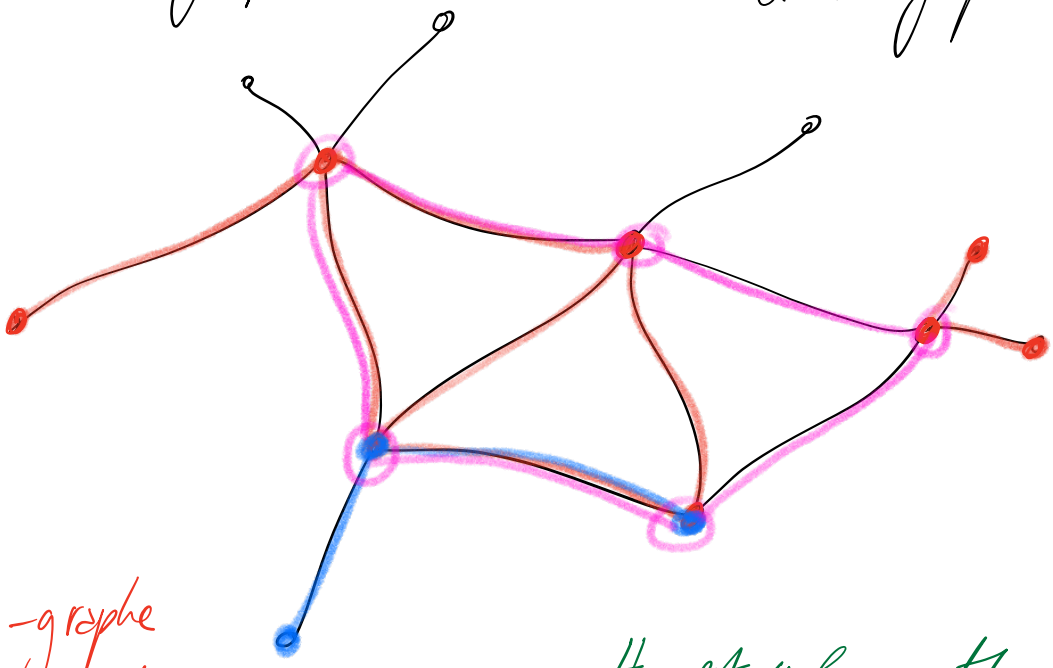
$$\#\text{arêtes} : \frac{\#\text{sommets} \cdot \text{degré}}{2} = \frac{4 \cdot 3}{2} = 6$$



$$\frac{5 \cdot 4}{2} = 10$$

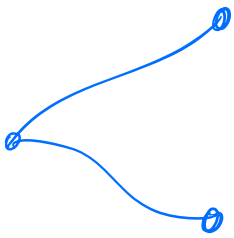
Notion de sous-graphe :

G un graphe

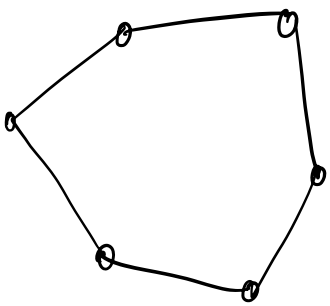


H est un sous-graphe de G

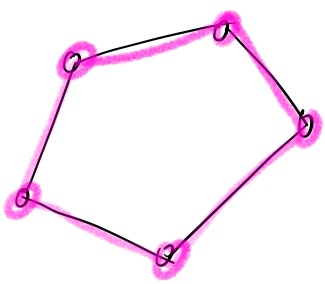
H est « plus petit » que G.



I est-il un sous-graphe de G. ? Oui



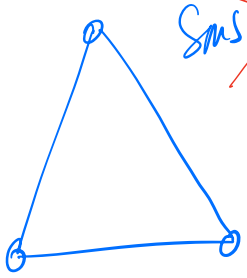
K est-il un sous-graphe de G. ? Non



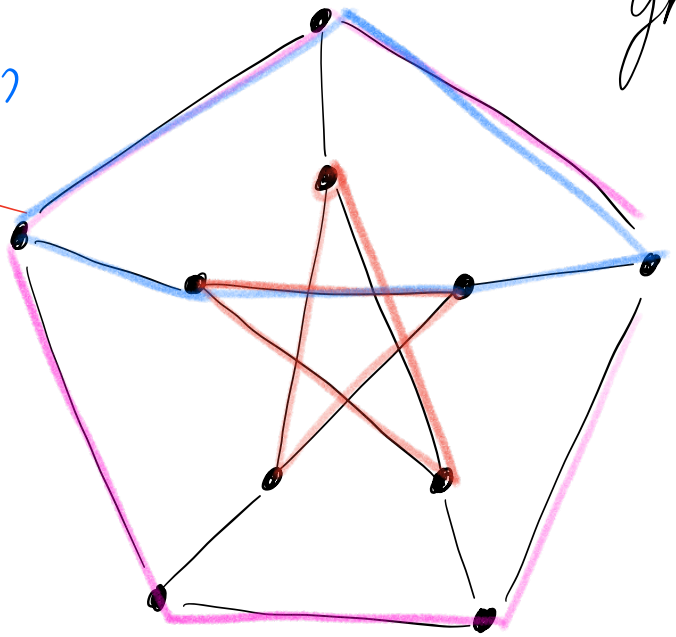
L est un sous-graphe de G.

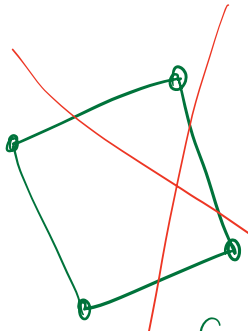
3.2.1

Graphe de PETERSEN

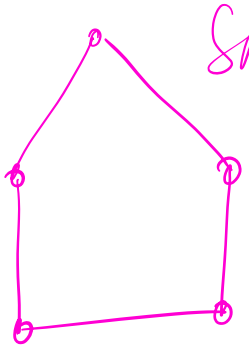


Sous-graphe ?





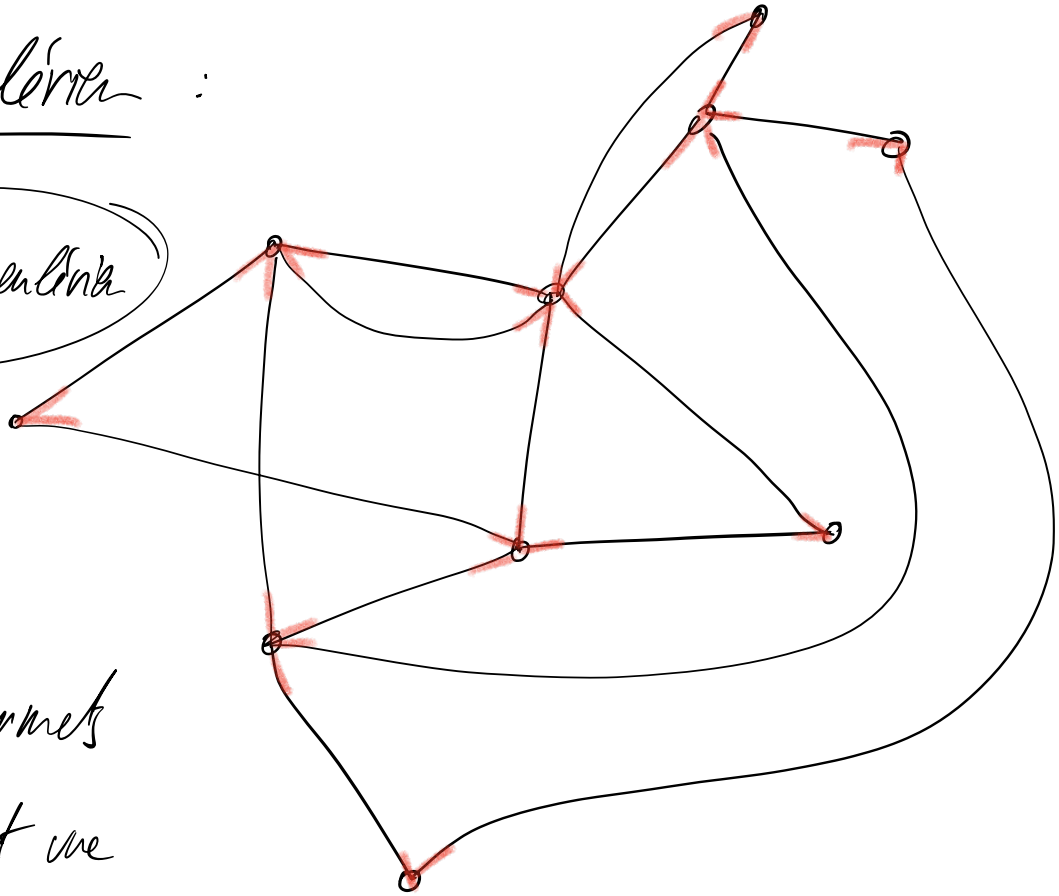
Sous-graphe ?



Sous-graphe ✓

Graphe eulérien :

G est eulérien



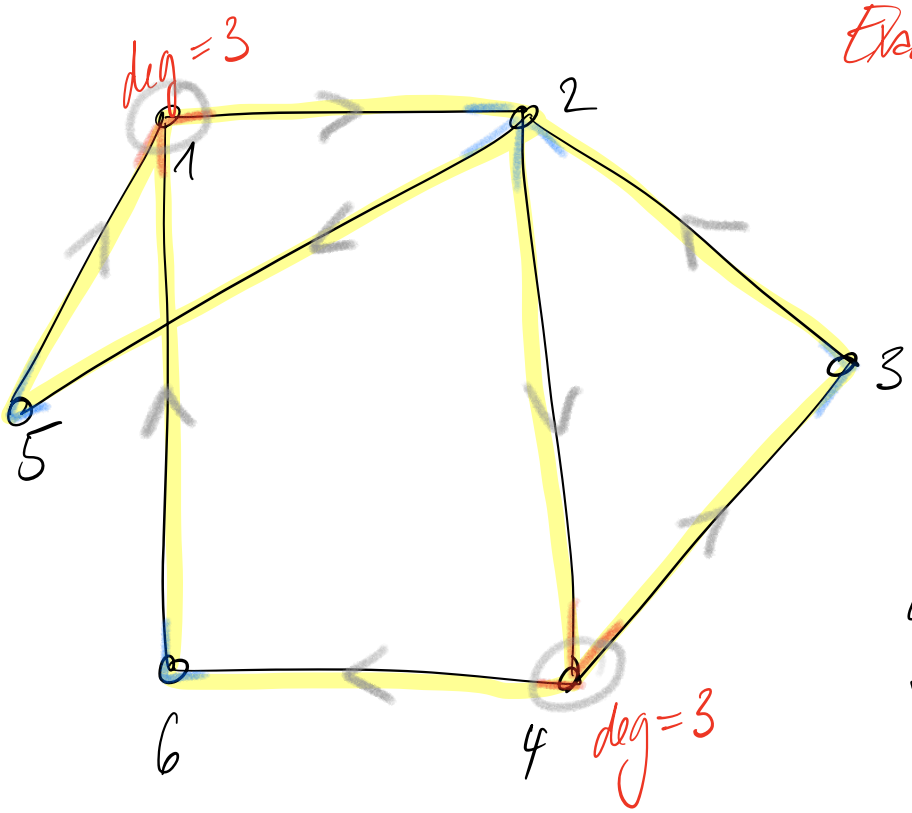
Chaîne fermée
par tous les sommets
passant une et une
seule fois par chaque arête

G est eulérien $\Leftrightarrow$ Le degré de chaque sommet est pair

---

G est semi-eulérien $\Leftrightarrow$ G admet exactement 2 sommets de degré impair.
(Tous les autres sommets sont de degré pair)

3.2.2



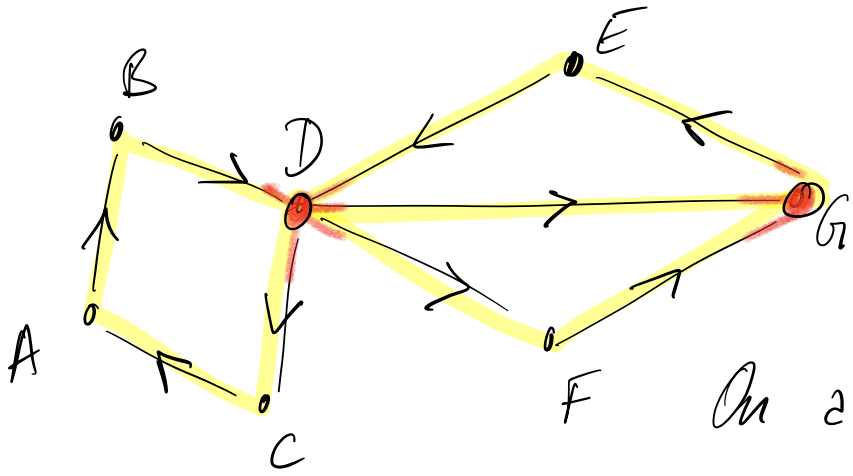
Exact. 2 sommets de deg. impair.

4 3 2 4 6 1 2 5 1

chaîne eulérien

3.2.3

2)

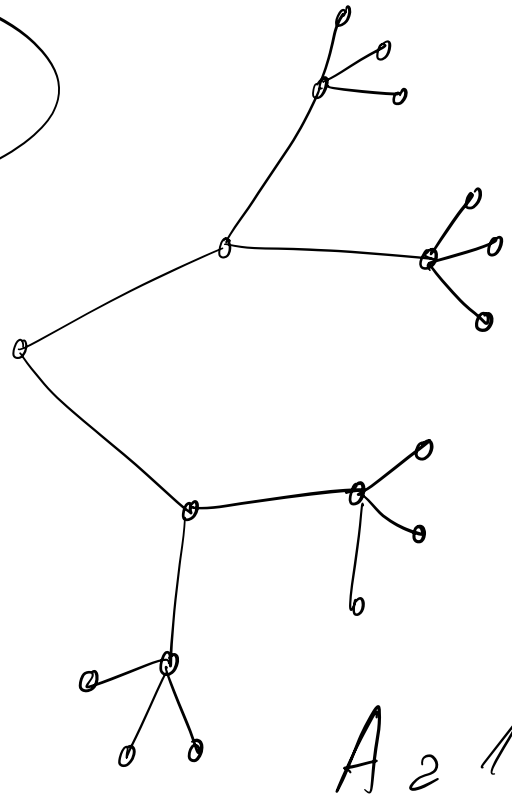


DCABDFGEDG

Code de la chaîne

On a bien une chaîne eulérienne.

Arbres



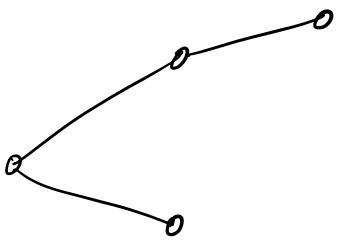
Un arbre est

- connexe (1 seul morceau)
- acyclique.

A 19 sommets

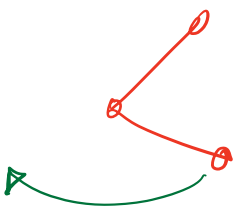
18 arêtes ↓ -1

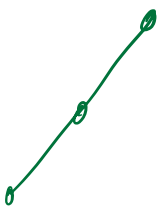
B est un arbre

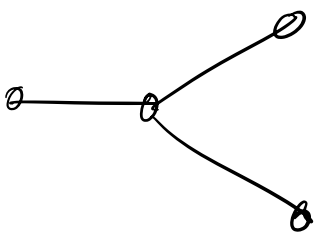


C est un arbre

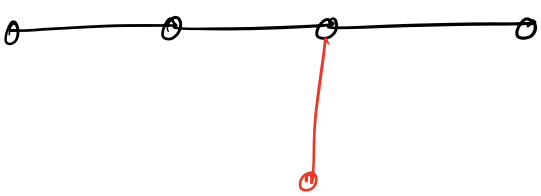
← Arbre

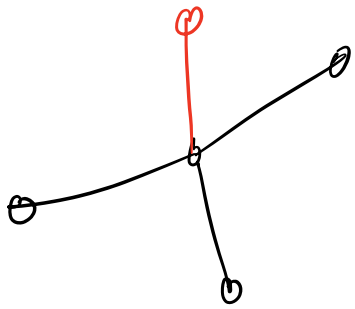


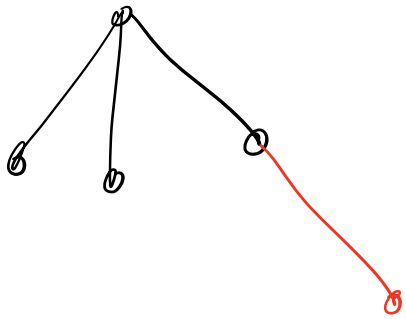




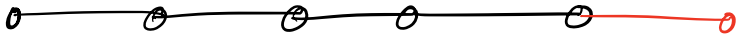
5 sommets

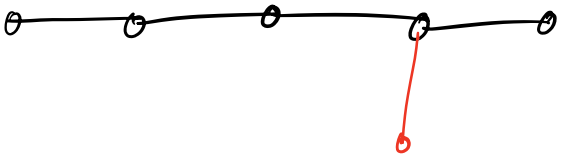


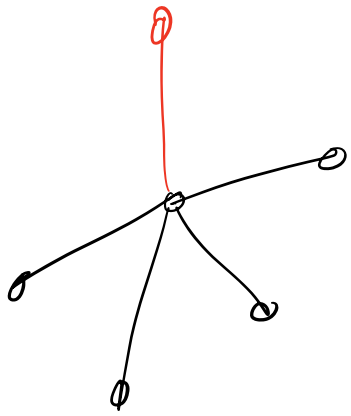


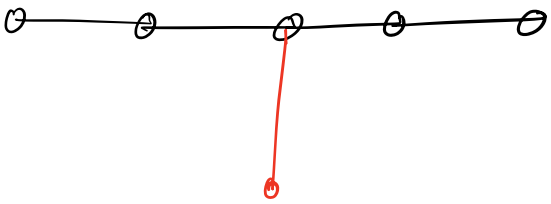


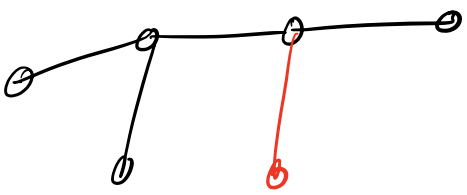
6 sommeti

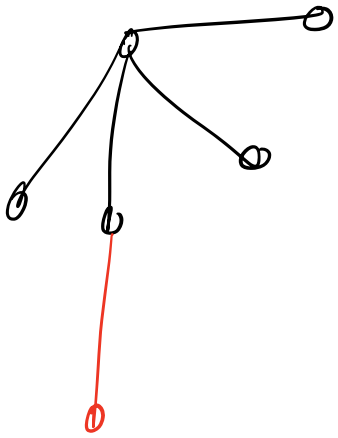








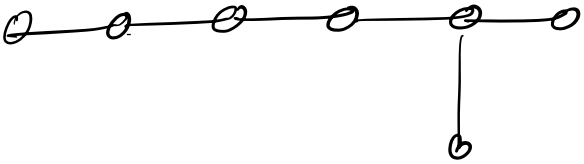




7 simmetrie

1

2



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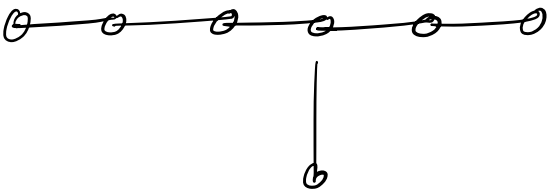

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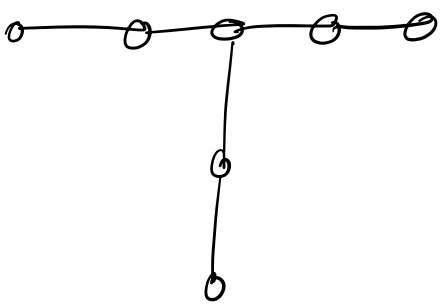

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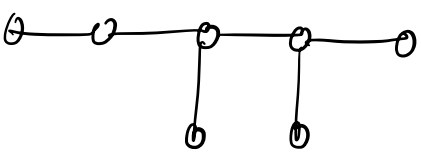

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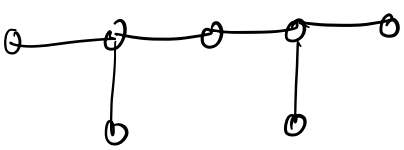

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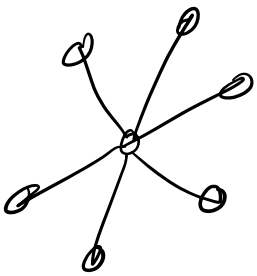

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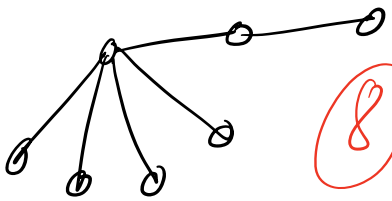

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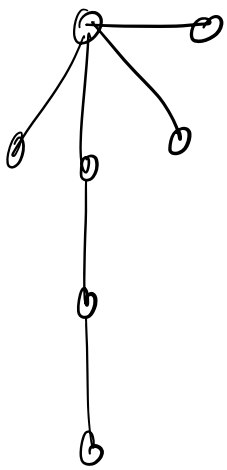

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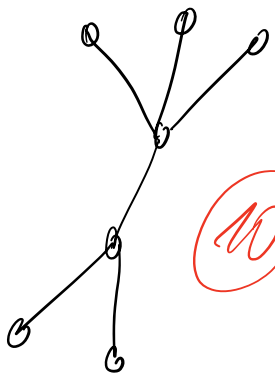

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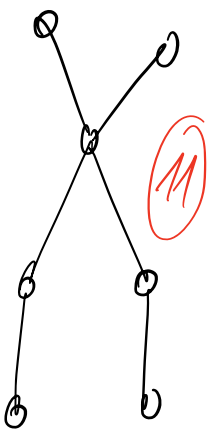
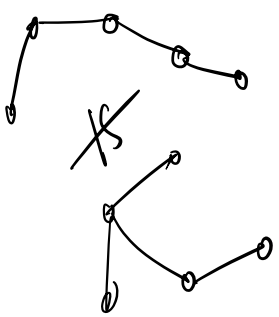
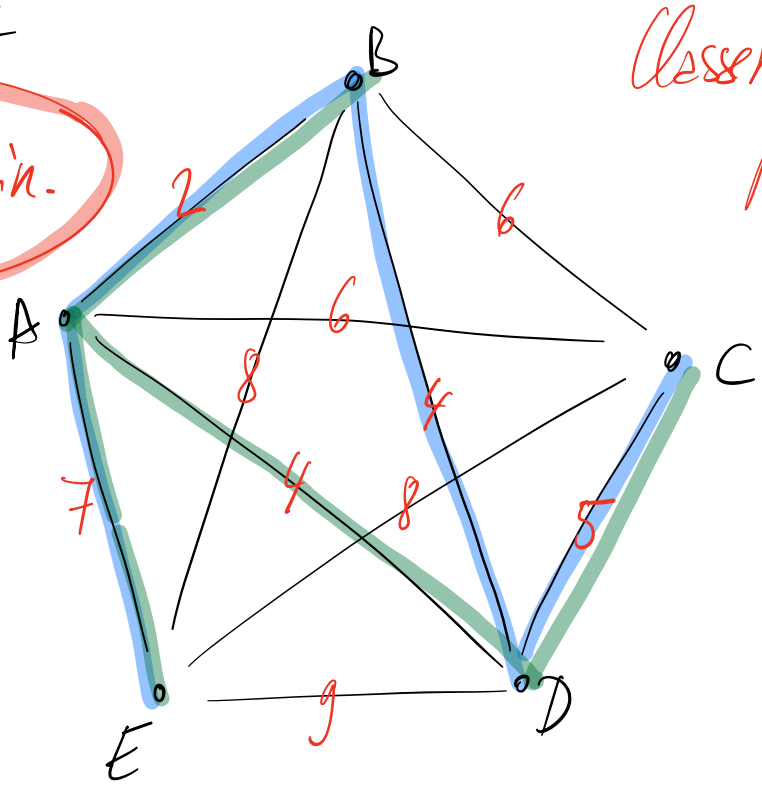


Arbre couvrant de poids min.





Classement des arêtes par poids :

2 / 4 / 4 / 5 / 6 / 6 / 7 / 8 / 8 / 9

KRUSKAL

Coût de la liaison de A à B : 2

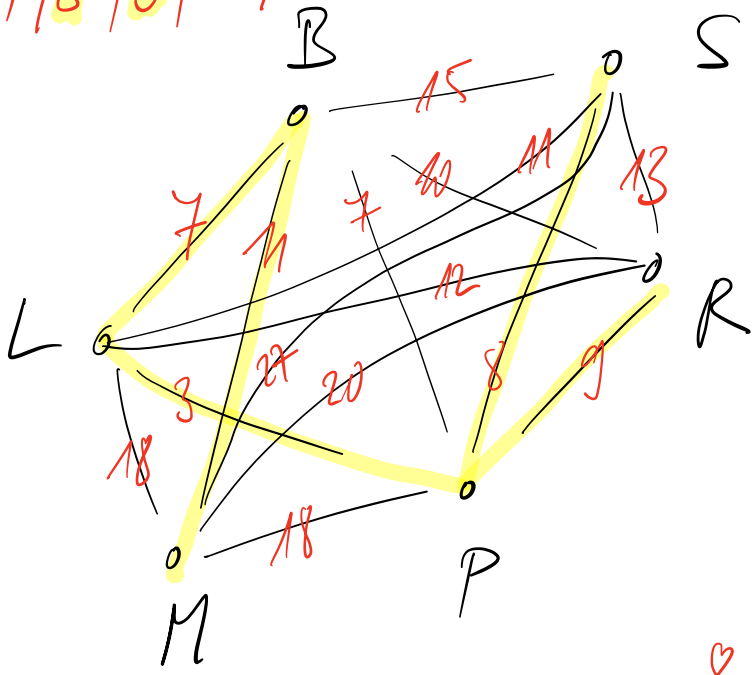
3.3.9

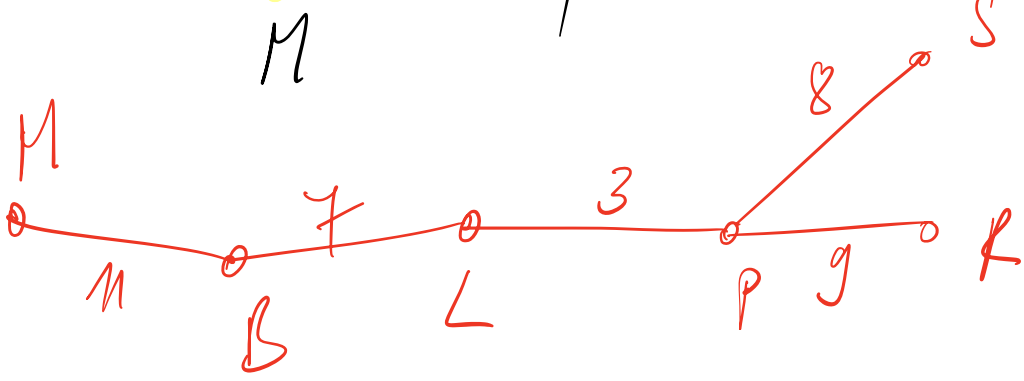
3.3.10

3.3.11

	Berlin	Londres	Moscou	Bris	Rome	Séville
Berlin		7	11	7	10	15
Londres	~~7~~		18	3	12	11
Moscou	~~11~~	~~18~~		18	20	27
Bris	~~7~~	~~3~~	~~18~~		9	8
Rome	~~10~~	~~12~~	~~20~~	~~9~~		13
Séville	~~15~~	~~11~~	27	~~8~~	~~13~~	

3 | 7 | 7 | 8 | 9 | 10 | 11 | 11 | 12 | 13 | 15 | 18 | 18 | 20 | 27





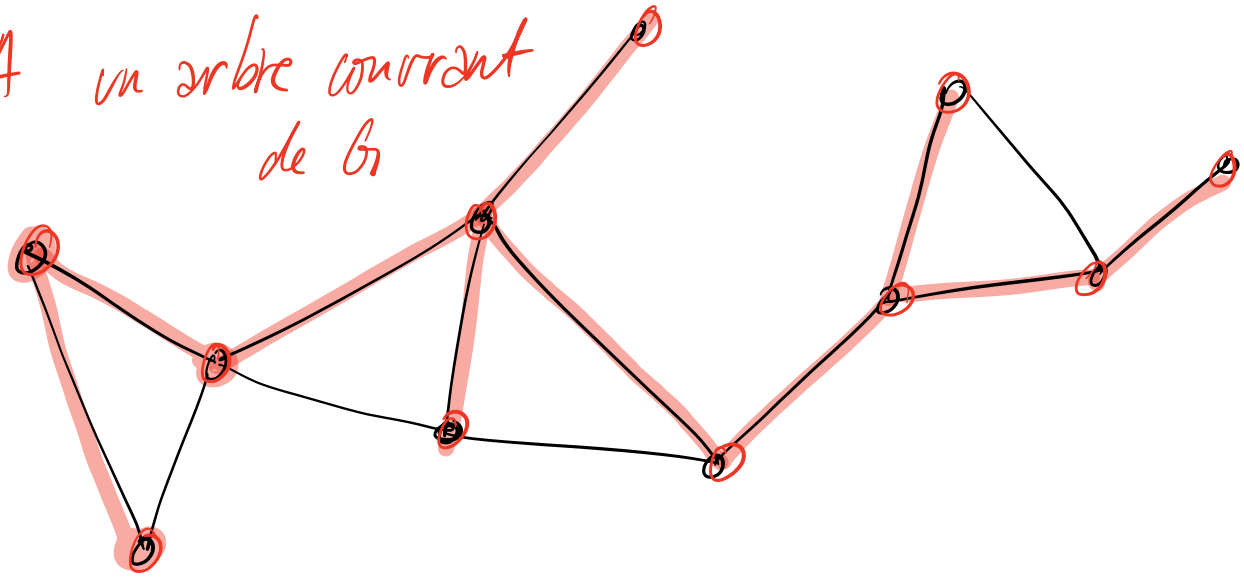
Σ poids = 38

G un graphe

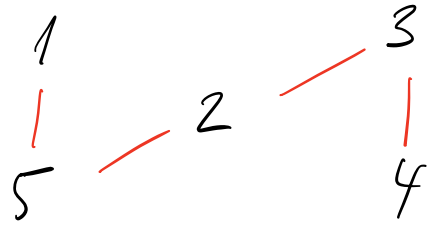
sommets : 11

arêtes : 10

A un arbre couvrant de G



3.3.4



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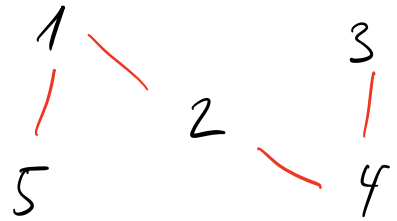
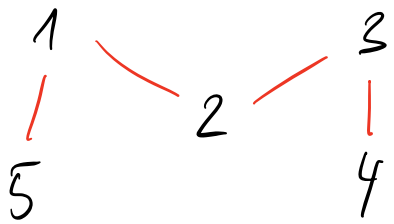


iso.

iso.



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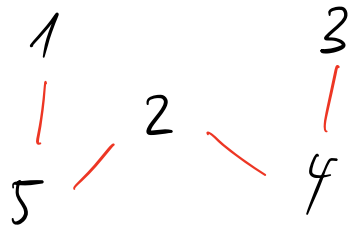
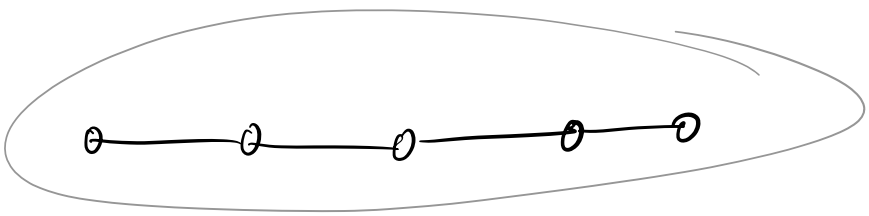
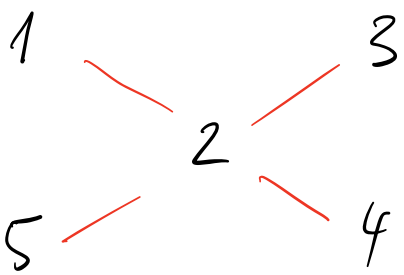
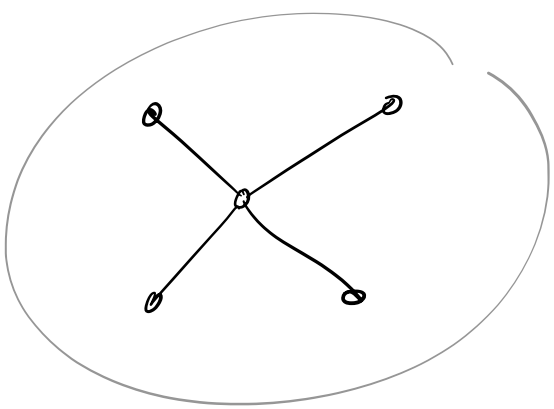
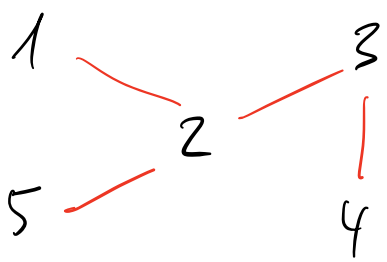


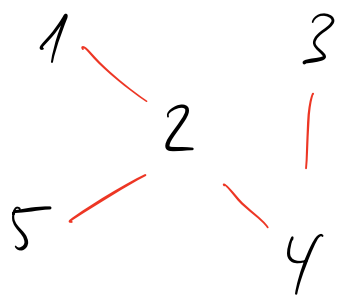


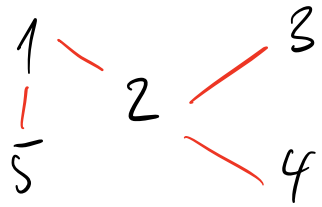






iso.





180.