

# Corrigé série 8

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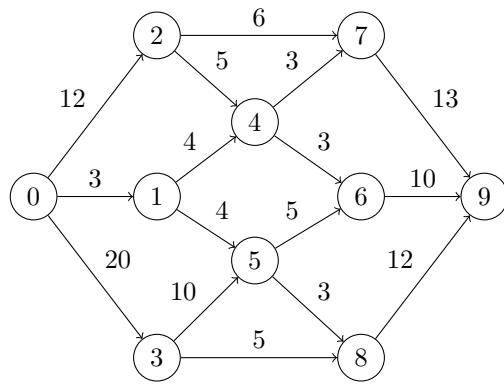
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# 1 Exercice 1

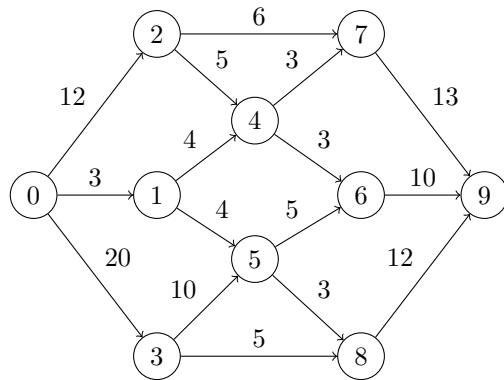
Note : les chemins qui mènent au puit destination sont marqués en rouge.

## 1.1 Question A

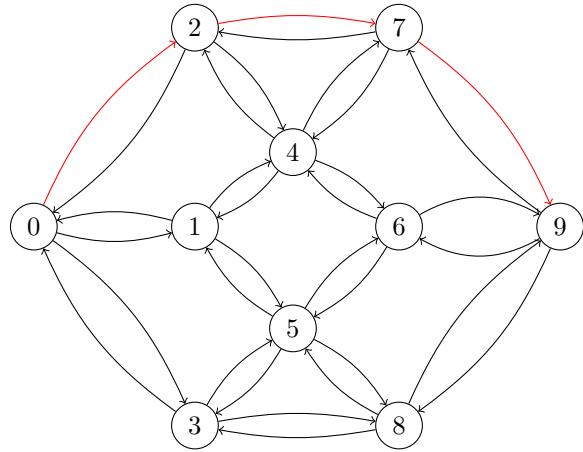
Graph de départ :



$G$  :

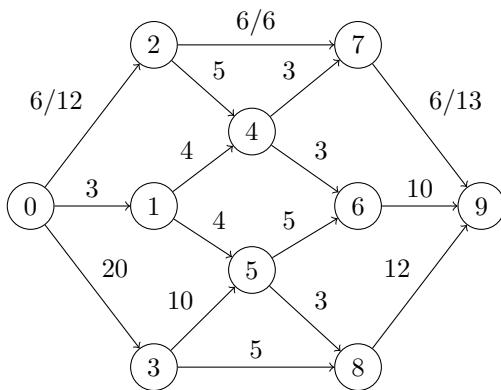


$G_{residuel}$  :

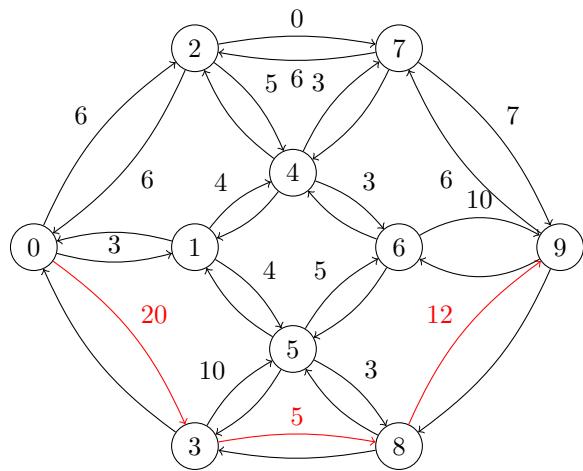


Flot maximal pour ce parcours : 6.

$G$  :

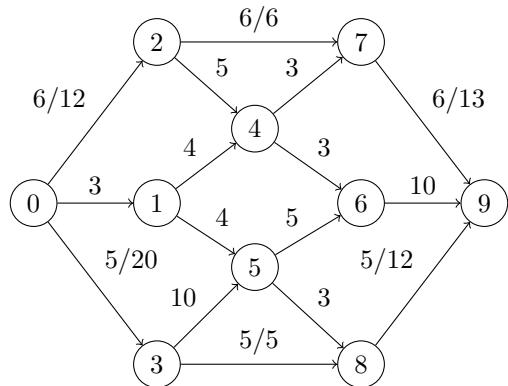


$G_{residuel}$  :

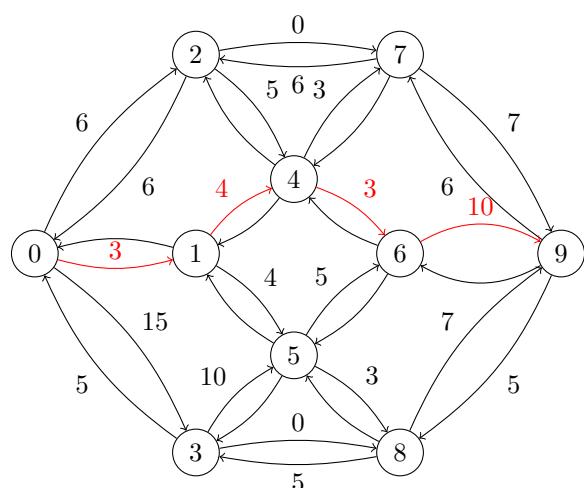


Flot maximal : 11.

$G :$

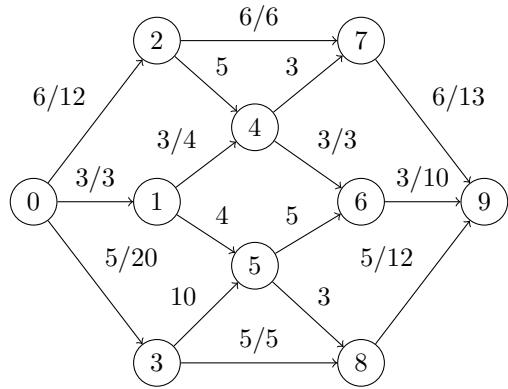


$G_{residuel} :$

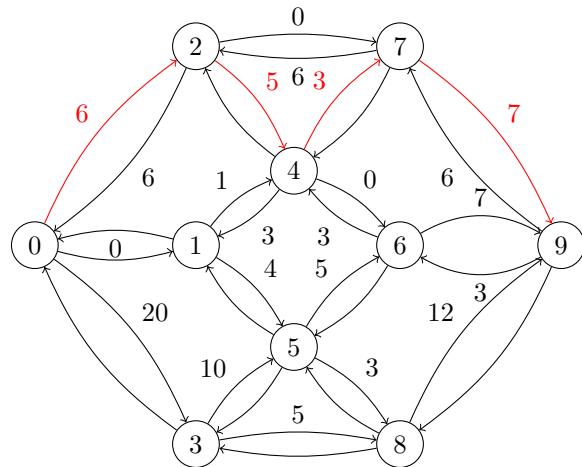


Flot maximal : 14

G;

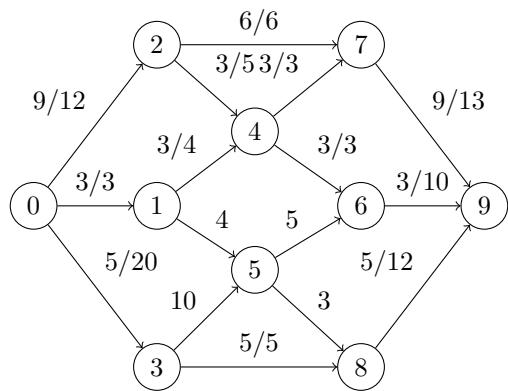


$G_{residuel} :$

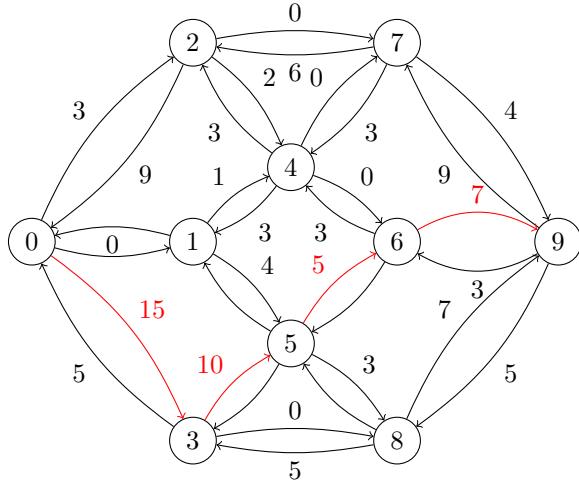


Flot maximal : 17

$G :$

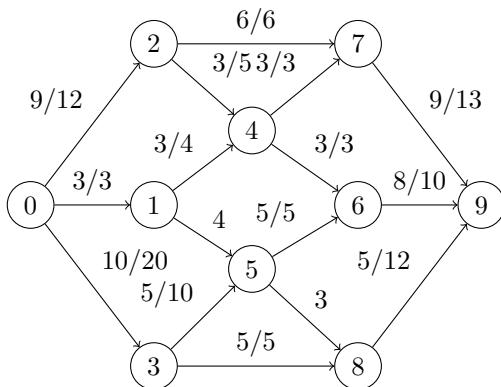


$G_{residuel} :$

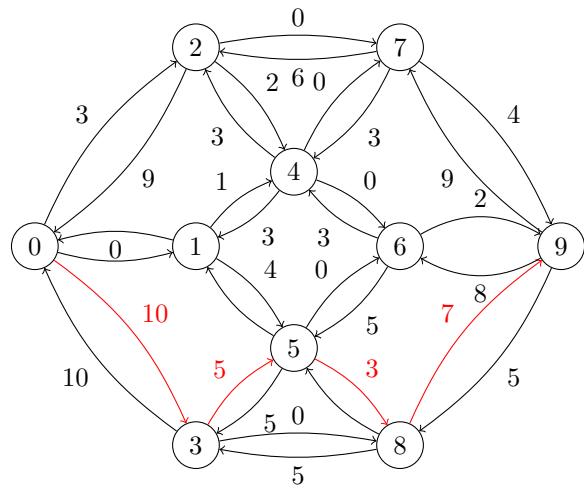


Flot maximal : 22

$G :$

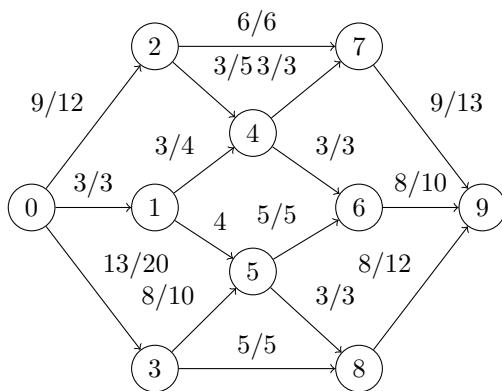


$G_{residuel} :$

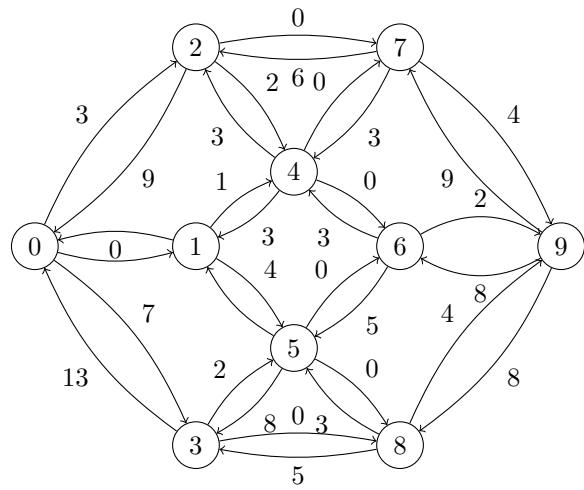


Flot maximal : 25.

$G$  :



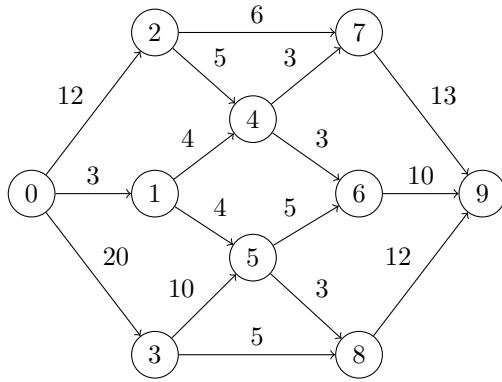
$G_{residuel}$  :



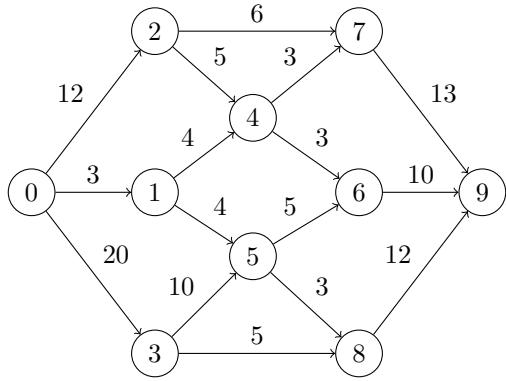
Remarque que dans ce parcours, il n'est plus possible d'atteindre le puit à partir de sa source et donc, le flot maximal est de 25.

## 1.2 Question B

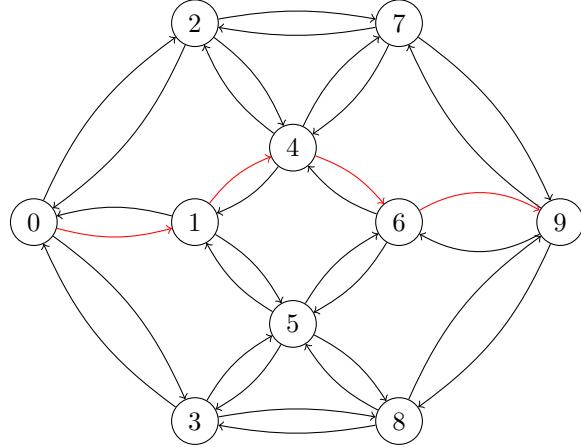
Graph de départ :



$G$  :

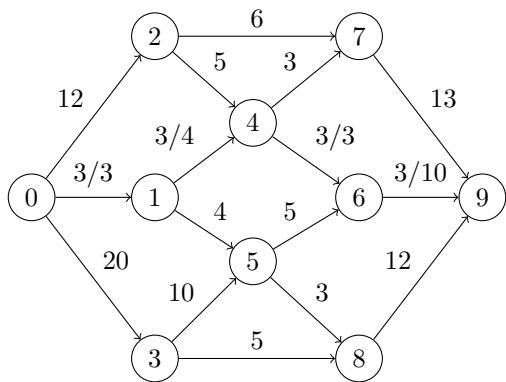


$G_{residuel} :$

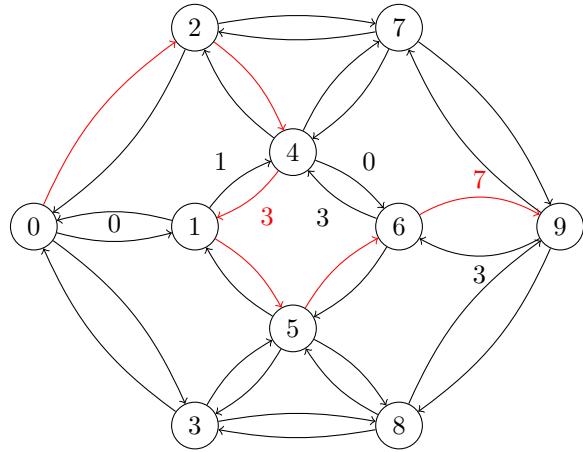


Flot maximal pour ce parcours : 3.

$G :$

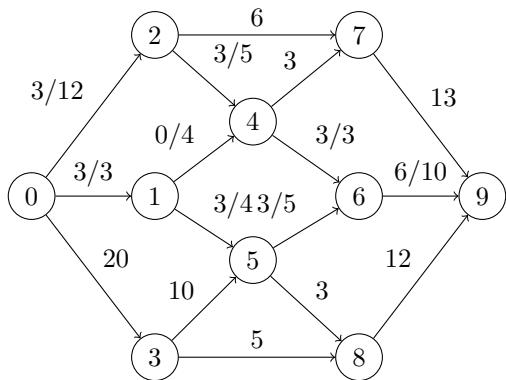


$G_{residuel} :$

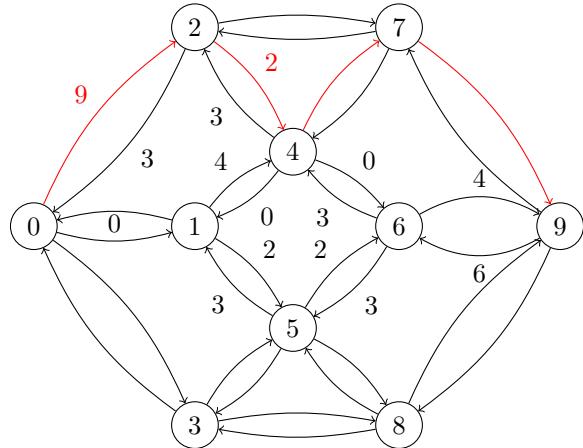


Flot maximale : 6

$G$  :

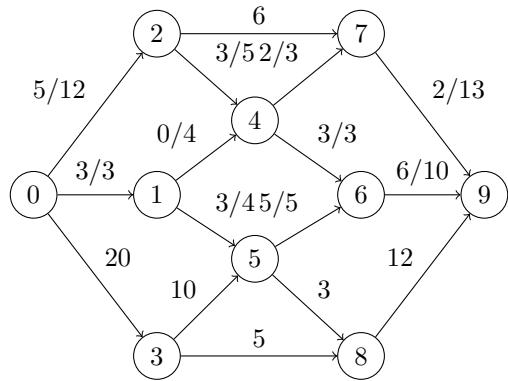


$G_{residuel}$  :

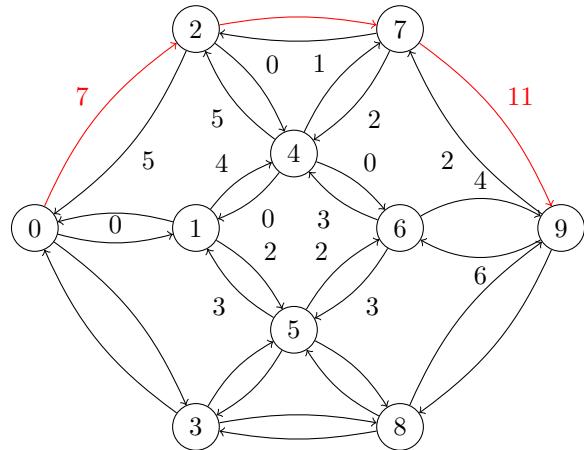


Flot maximale : 8

$G$  :

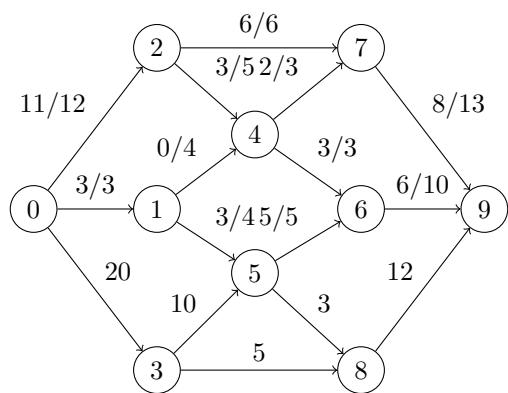


$G_{residuel}$  :

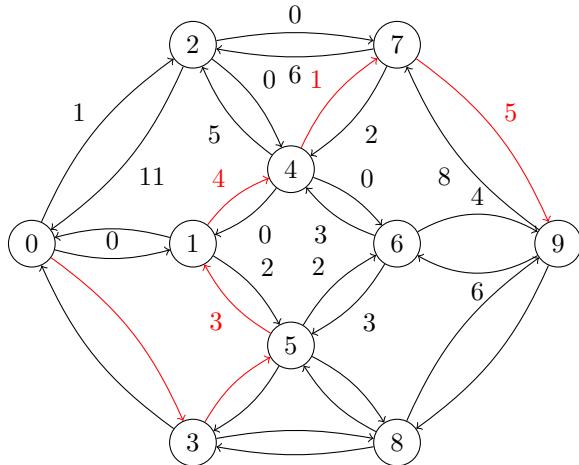


Flot maximal : 14

$G$  :

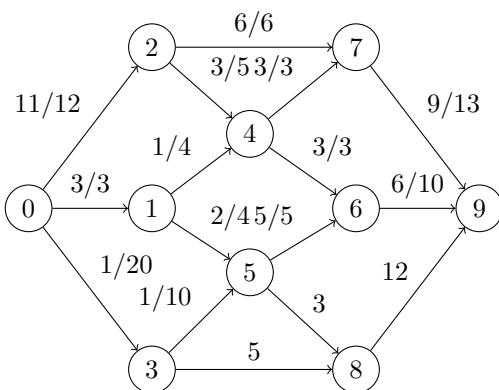


$G_{residuel} :$

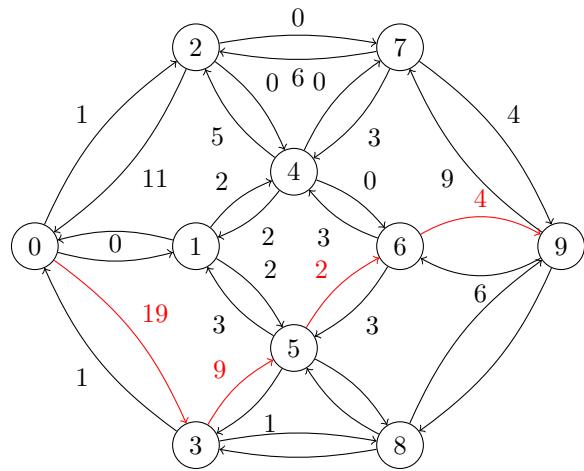


Flot maximal : 15

$G :$

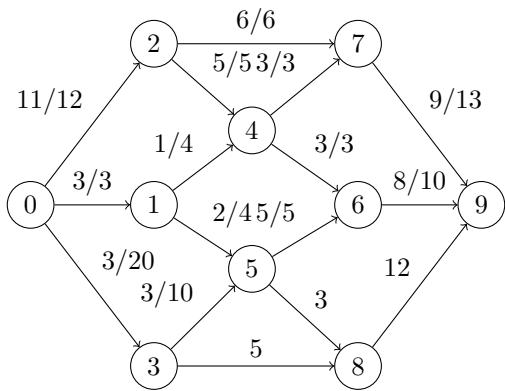


$G_{residuel} :$

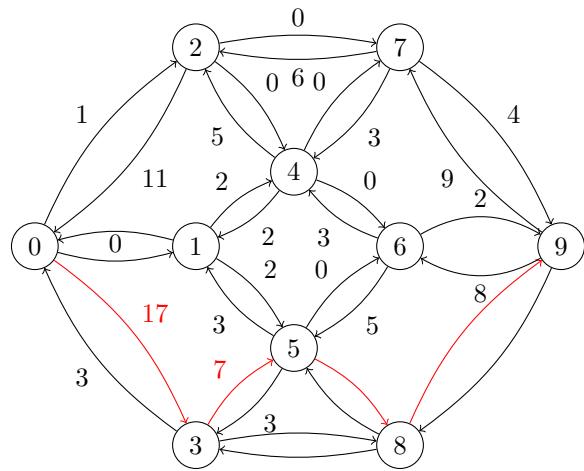


Flot maximal : 17

$G$  :

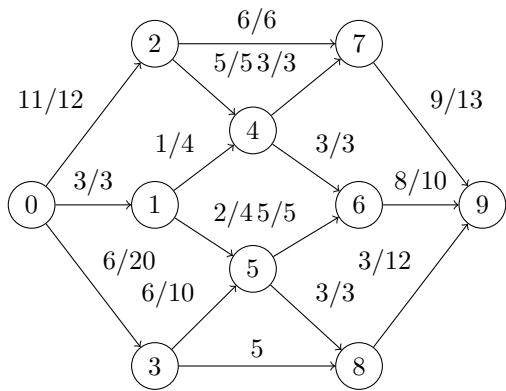


$G_{residuel}$  :

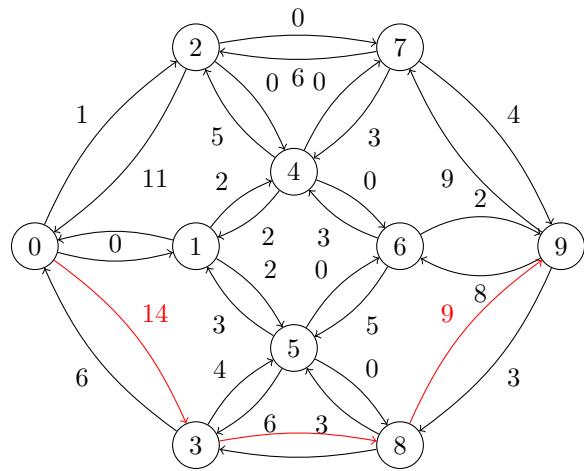


Flot maximal : 20

$G$  :

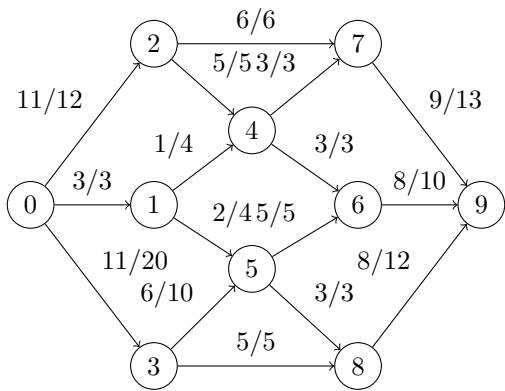


$G_{residuel}$  :

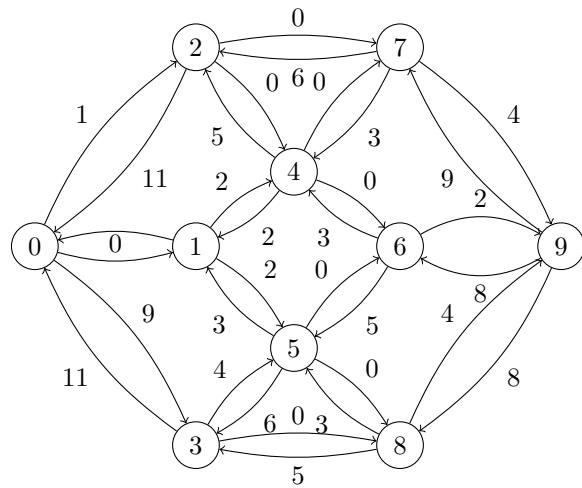


Flot maximal : 25.

$G$  :

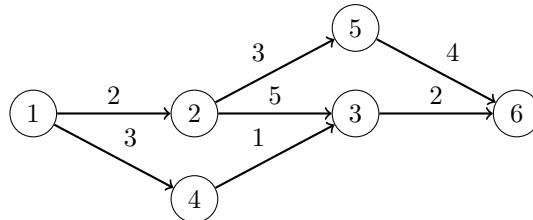


$G_{residuel}$  :

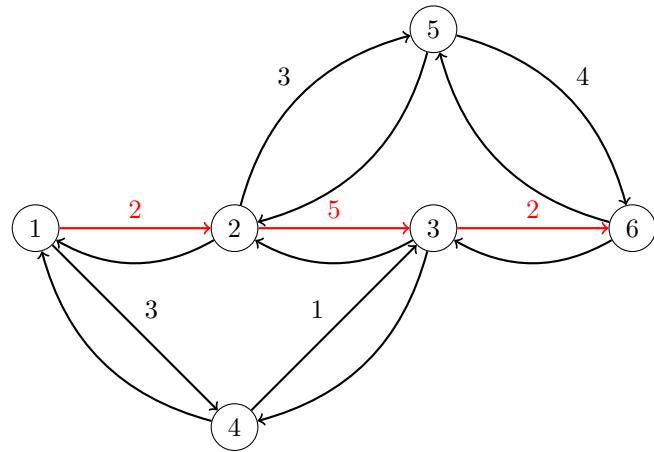


En tentant une nouvelle recherche en profondeur, il n'y a pas d'autre chemins possibles pour se rendre au puit en partant de la source. Donc, le flot maximal est de 25.

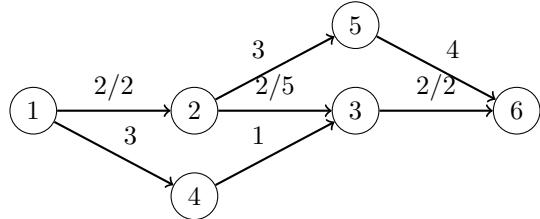
## 2 Exercice 2



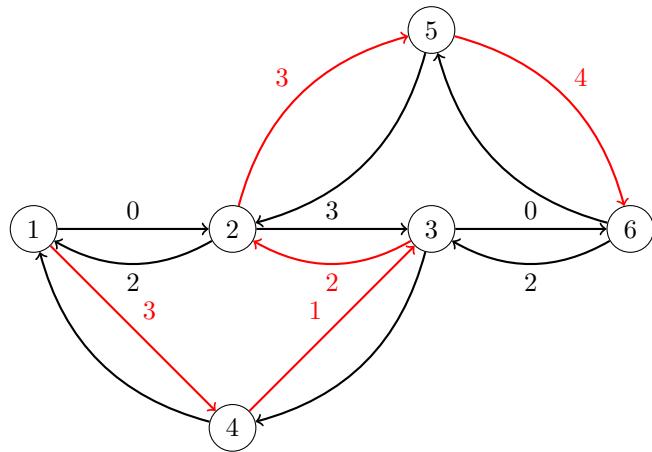
$G$  résiduel :



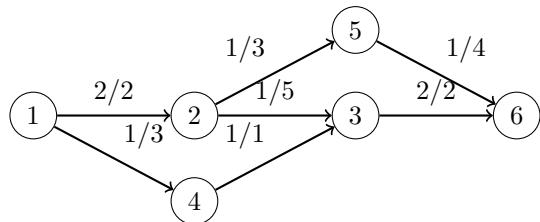
Flot maximal : 2



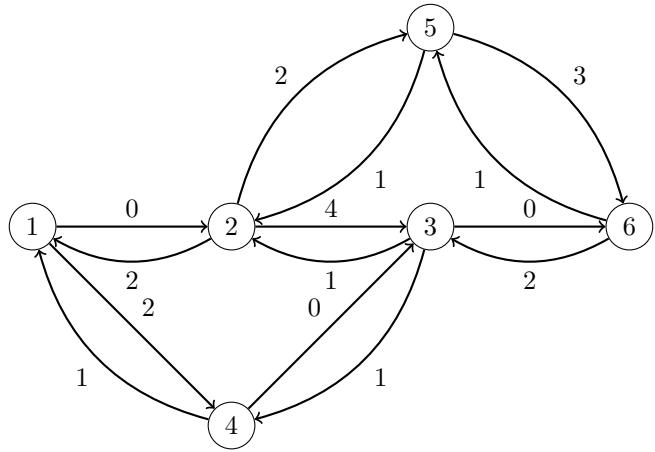
$G$  résiduel :



Flot maximal : 3



$G$  résiduel :



Il n'y a plus de chemins possibles qui se rend à 6 si on part de 1 et donc, le flot maximal est de 3.

### 3 Exercice 3

#### 3.1 Question A

Ordre de visite : 1, 2, 4, 3, 6, 5

	1	2	3	4	5	6
Parent	Null	1	4	2	6	3
Distance	0	25	60	45	102	72

#### 3.2 Question B

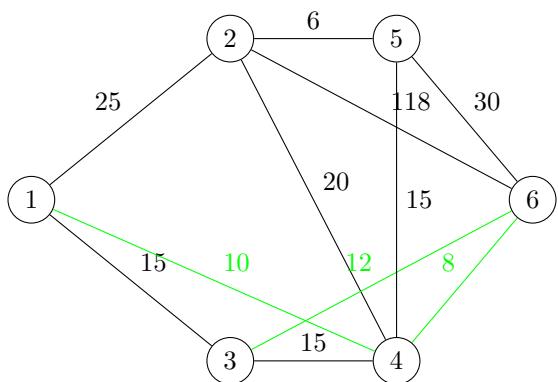
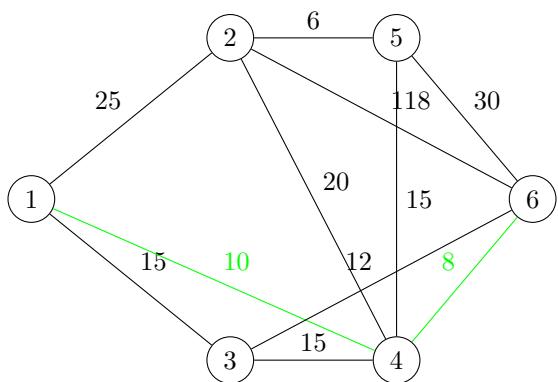
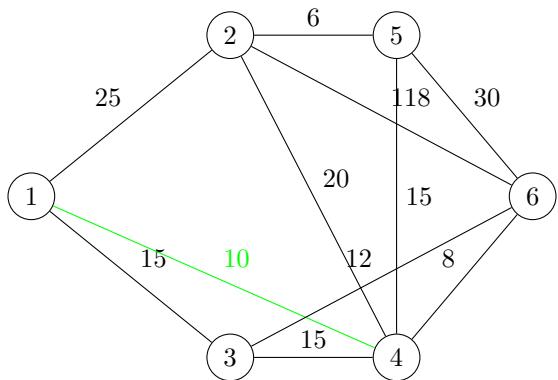
Ordre visite : 1, 2, 3, 4, 6, 5

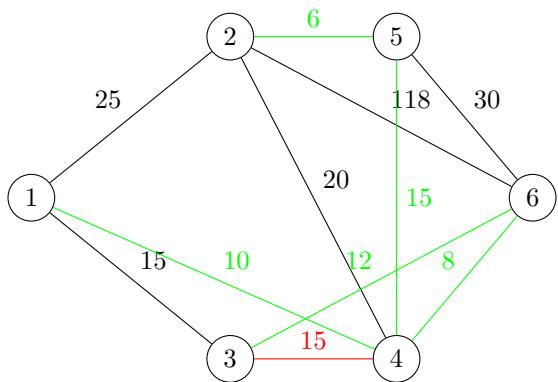
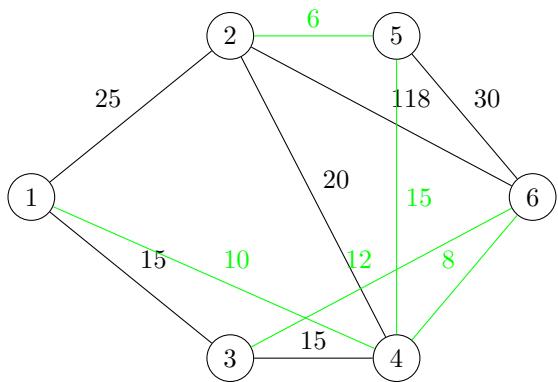
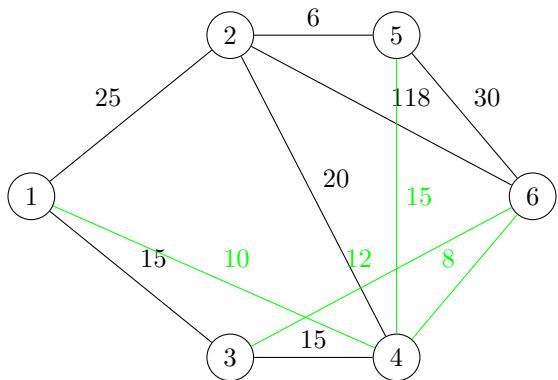
	1	2	3	4	5	6
Parent	Null	1	1	2	4	2
Distance	0	25	15	45	60	143

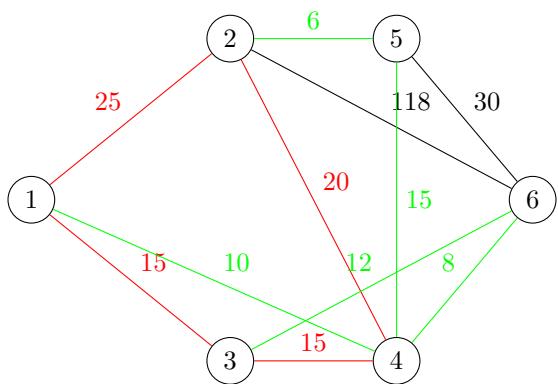
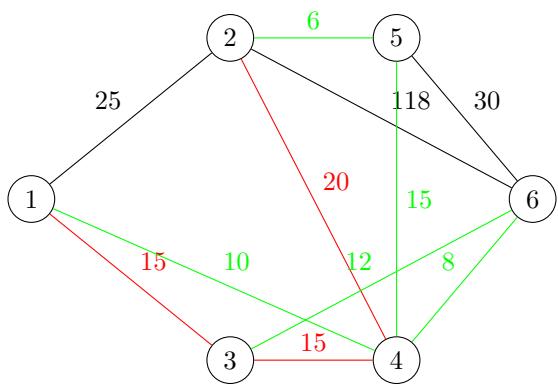
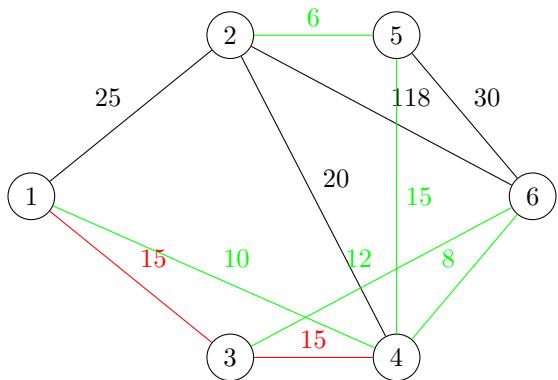
#### 3.3 Question C

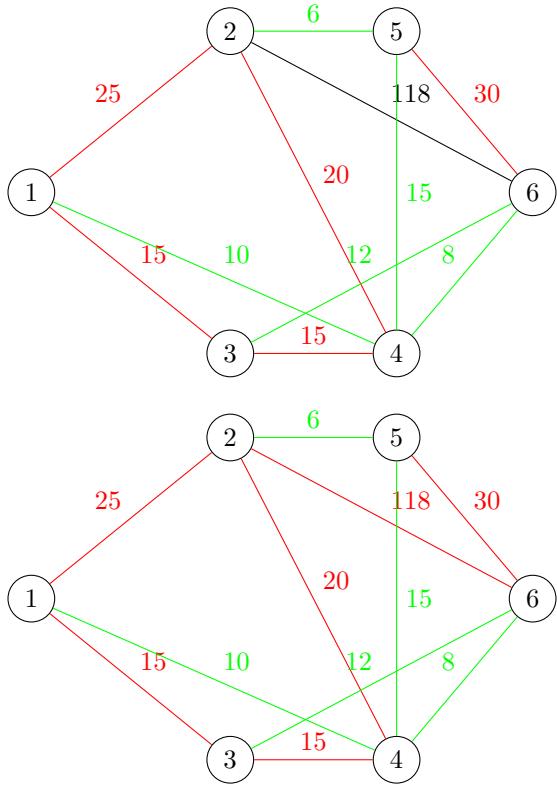
##### 3.3.1 Prim

Note : les arrêts appartenant dans l'arbre de recouvrement minimale seront en verts sinon en rouges.





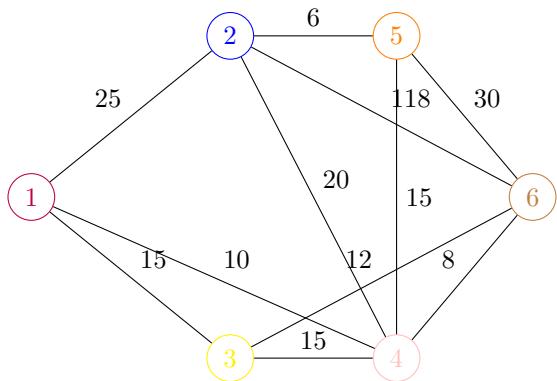


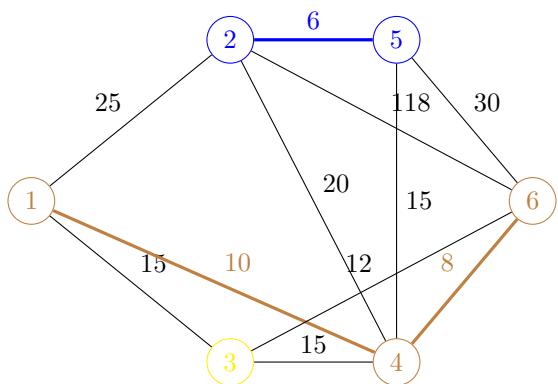
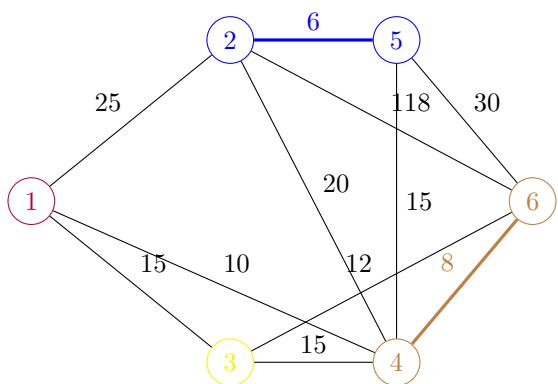
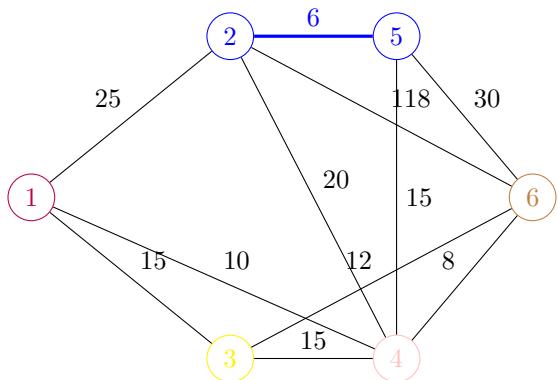


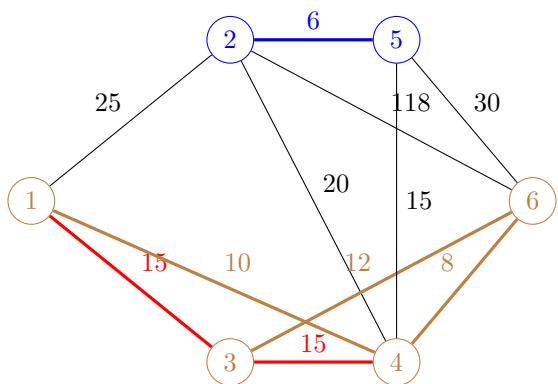
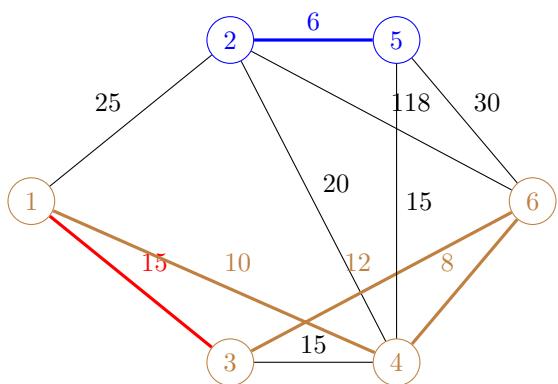
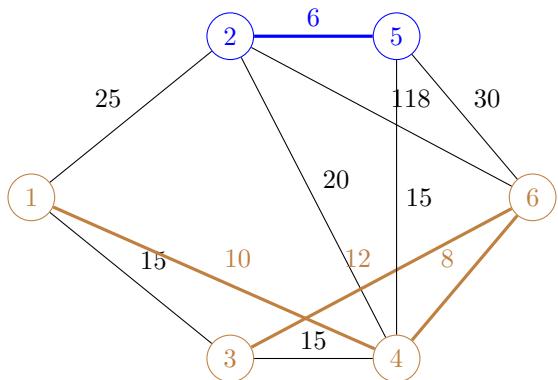
Le coût de pour construire l'abre de recourement minimal est de 51.

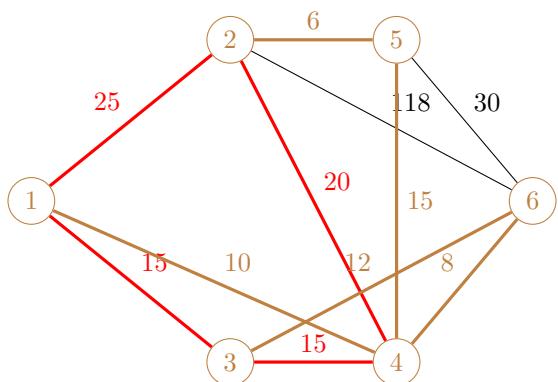
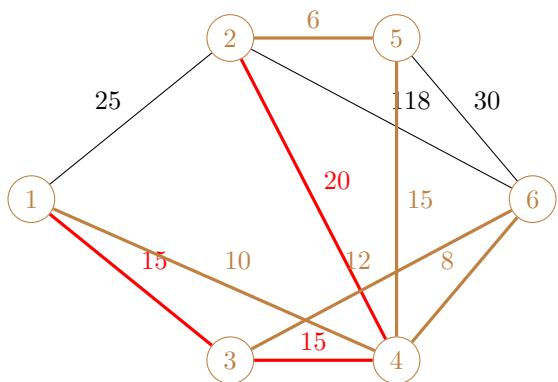
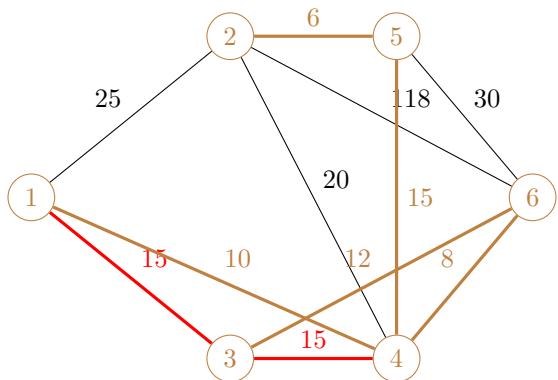
### 3.3.2 Kruskal

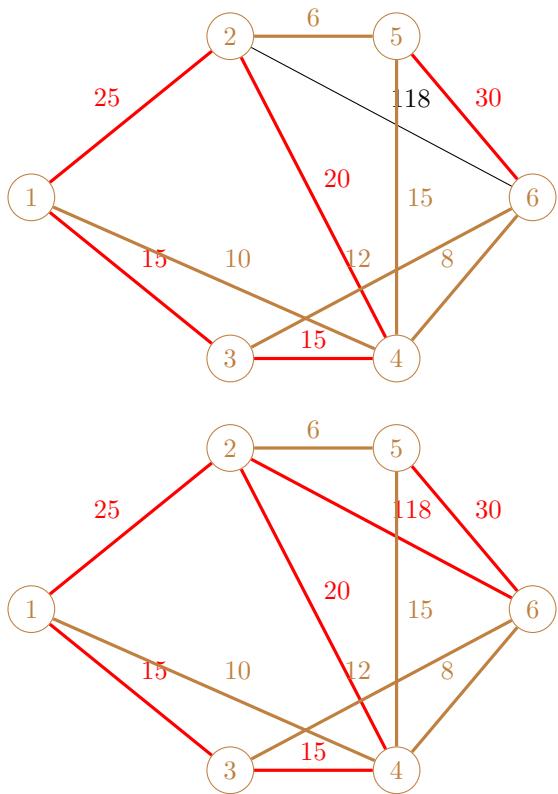
Chaque ensemble (singleton ou nouvel ensemble) seront caractérisés par une couleur pour le(s) sommet(s). Les arrêts en rouge signifient qu'il est impossible de faire l'union de deux ensembles.







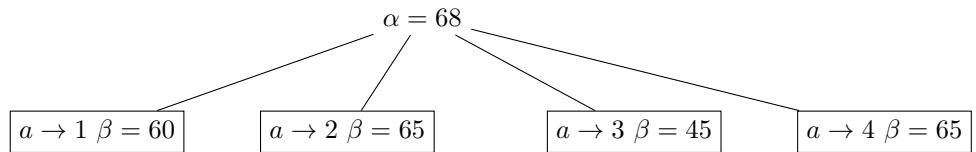


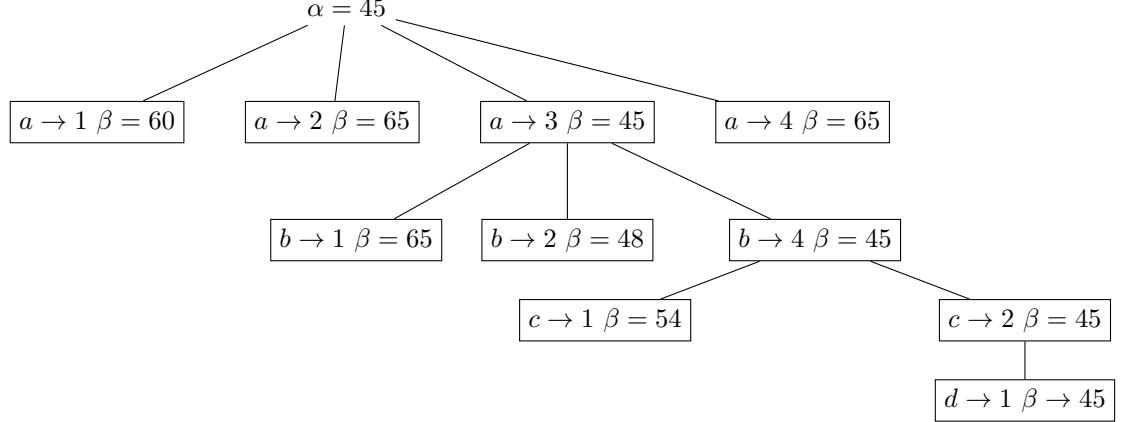
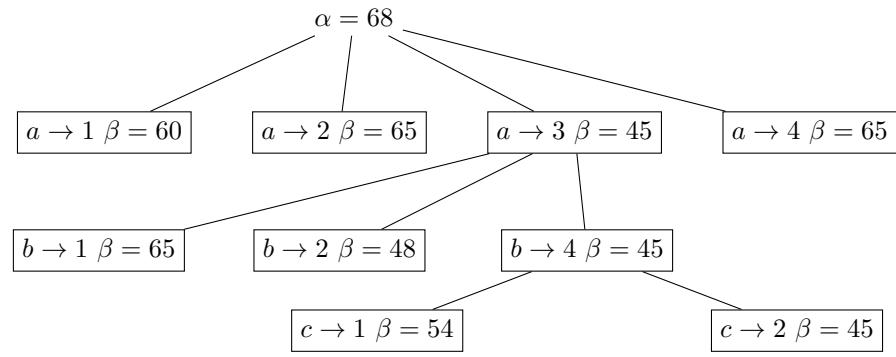
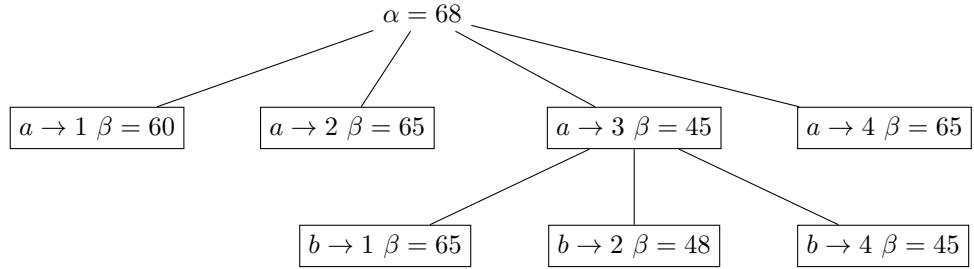


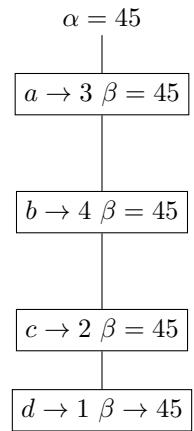
Coût de l'arbre de recouvrement minimal : 51

## 4 Exercice 4

### 4.1 Question A







Attribution des tâches :  $a \rightarrow 3, b \rightarrow 4, c \rightarrow 2, d \rightarrow 4$ .

Coût : 45.

## 4.2 Question B

Avec une approche gloutonne, on aurait l'attribution des tâches suivantes :  $a \rightarrow 3, b \rightarrow 4, c \rightarrow 2, d \rightarrow 1$  pour un coût de 45.

## 5 Exercise 5

Solution possible :

1. **Fonction ESTARBRE(G)**
2.     feuilles  $\leftarrow \{\emptyset\}$
3.     nbSommets  $\leftarrow |G.sommets|$
4.     estEnBoucle  $\leftarrow faux$
5.     Tant que nbSommets  $> 2 \wedge \neg estEnBoucle$  faire
6.         feuillesTemp  $\leftarrow \{\emptyset\}$
7.         Pour  $s \in G.sommets$  faire
8.             Si  $s \notin feuilles$  alors
9.                 voisins  $\leftarrow 0$
10.          Pour  $v \in G.successeurs(s)$  faire
11.                 Si  $v \notin feuilles$  alors
12.                     voisins  $\leftarrow voisins + 1$
13.                 Fin Si
14.          Fin Pour
15.         Si voisins  $\leq 1$  alors
16.             feuillesTemp  $\leftarrow feuillesTemp \cup \{s\}$
17.         Fin Si
18.         Fin Pour
19.         Si  $|feuillesTemp| = 0$  alors
20.             estEnBoucle  $\leftarrow vrai$
21.         Sinon
22.             nbSommets  $\leftarrow nbSommets - |feuillesTemp|$
23.             feuilles  $\leftarrow feuilles \cup feuillesTemp$
24.         Fin Si
25.         Fin Pour
26.         Renvoyer  $nbSommets \neq 0 \wedge nbSommets \leq 2 \wedge \neg estEnBoucle$
27. Fin Fonction