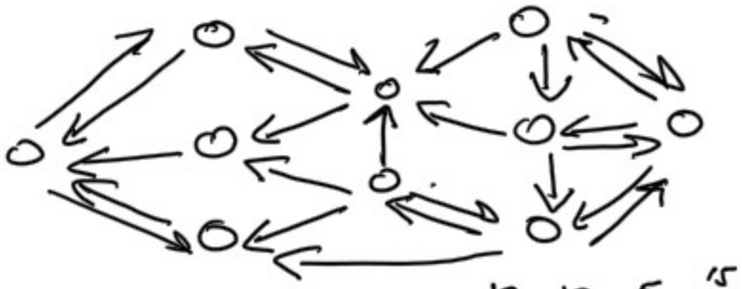
$S \xrightarrow{25} U_1 \xrightarrow{25} V_1 \xrightarrow{15} M_1 \xrightarrow{20} P : 15$

$S \xrightarrow{15} U_2 \xrightarrow{5} V_1 \xrightarrow{5} M_2 \xrightarrow{20} P : 5$

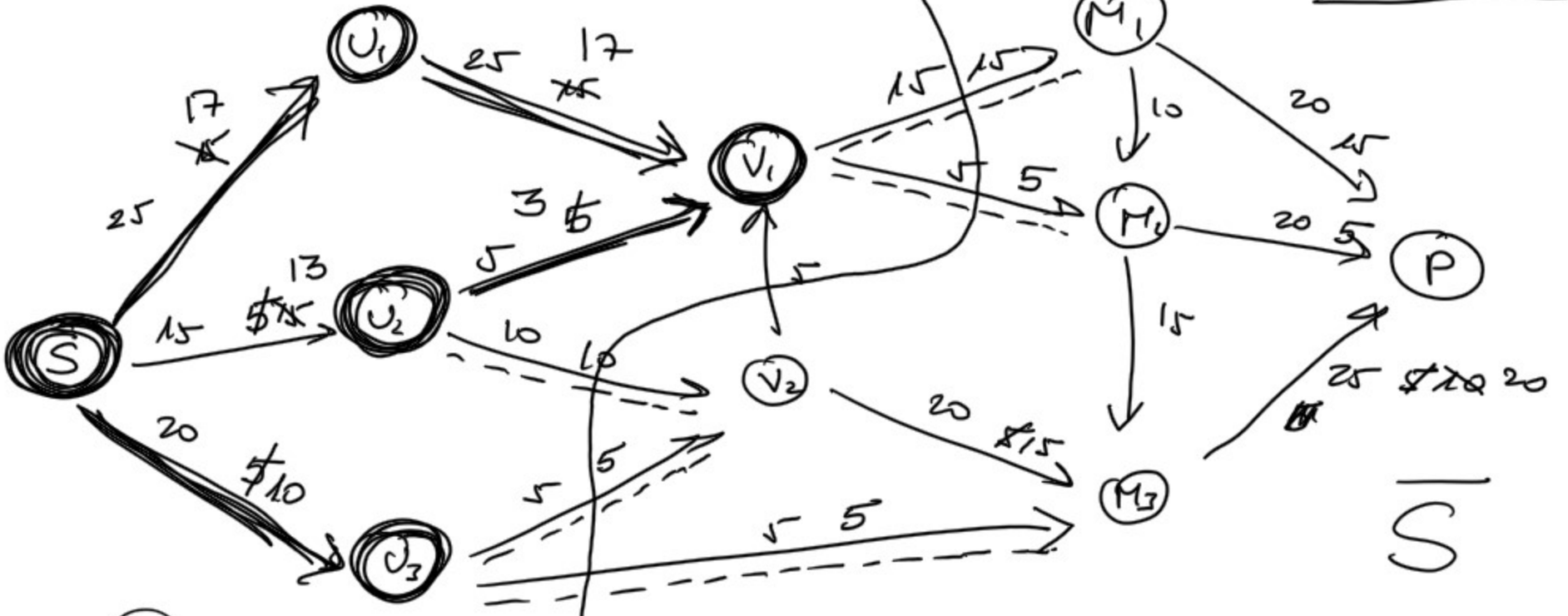
$S \xrightarrow{25} U_3 \xrightarrow{5} V_2 \xrightarrow{20} M_3 \xrightarrow{25} P : 5$

$S \xrightarrow{15} U_3 \xrightarrow{5} M_3 \xrightarrow{20} P : 5$

$S \xrightarrow{10} U_2 \xrightarrow{10} V_2 \xrightarrow{15} M_3 \xrightarrow{15} P : 10$



$S \xrightarrow{10} U_1 \xrightarrow{10} V_1 \xrightarrow{5} U_2 \xrightarrow{15} S$



$c(S, \overline{S}) = 40 \qquad v(f) = 40$

$S \xrightarrow{30} U_1 \xrightarrow{18} V_2 \xrightarrow{19} V_1 \xrightarrow{22} V_4 \xrightarrow{24} V_5 \xrightarrow{16} V_3 \xrightarrow{15} M_3 \xrightarrow{19} P : 15$

$S \xrightarrow{16} U_2 \xrightarrow{8} V_1 \xleftarrow{15} V_2 \xrightarrow{7} M_2 \xrightarrow{19} P : 7$

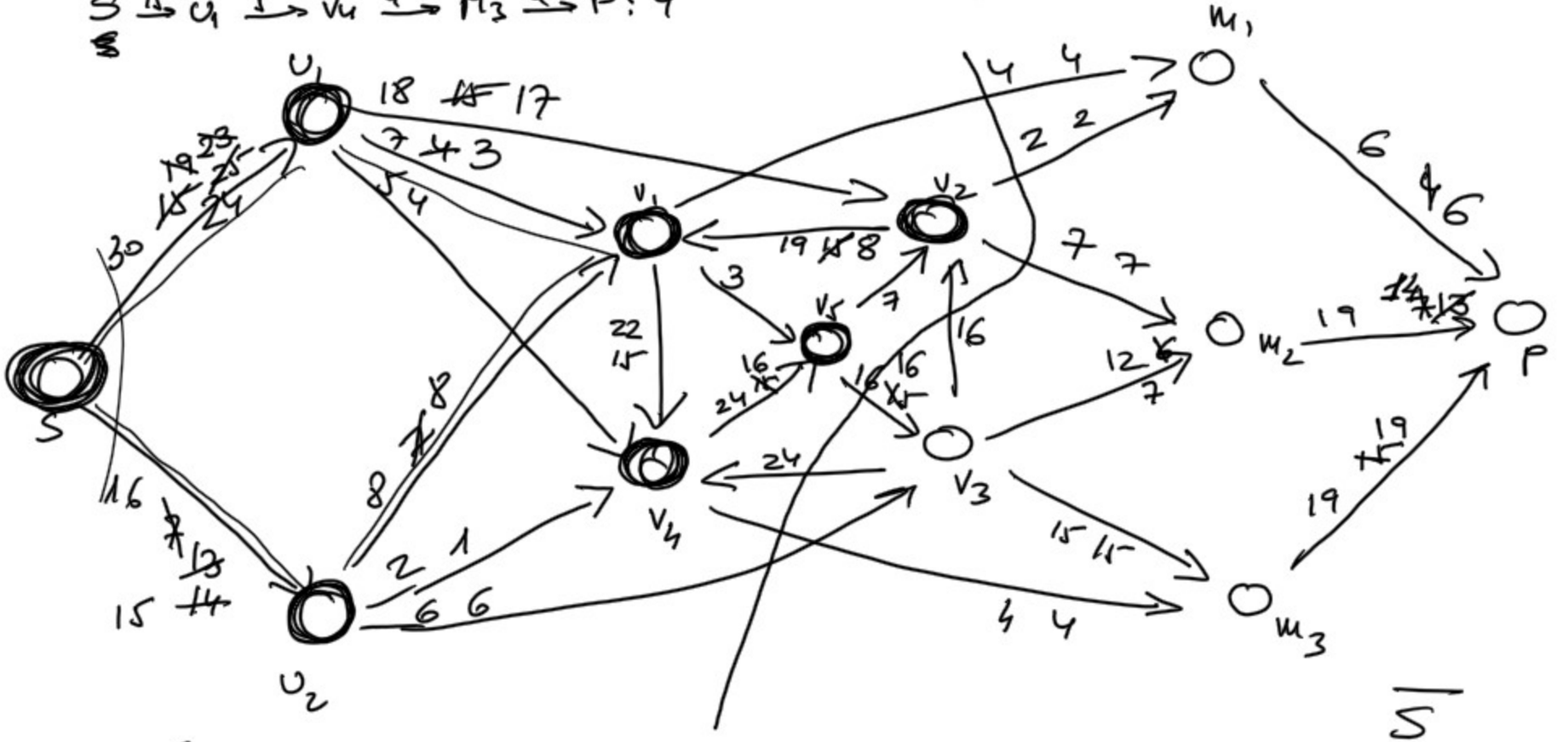
$S \xrightarrow{9} U_2 \xrightarrow{6} V_3 \xrightarrow{12} M_2 \xrightarrow{12} P : 6$

$S \xrightarrow{15} U_1 \xrightarrow{5} V_4 \xrightarrow{4} M_3 \xrightarrow{4} P : 4$

$S \xrightarrow{11} U_1 \xrightarrow{7} V_1 \xrightarrow{4} M_1 \xrightarrow{6} P : 4$

$S \xrightarrow{7} U_1 \xrightarrow{3} V_2 \xrightarrow{2} M \xrightarrow{3} P : 2$

$S \to U_2 \to V_4 \to V_5 \xrightarrow{1} V_3 \to M_2 \to P : 1$



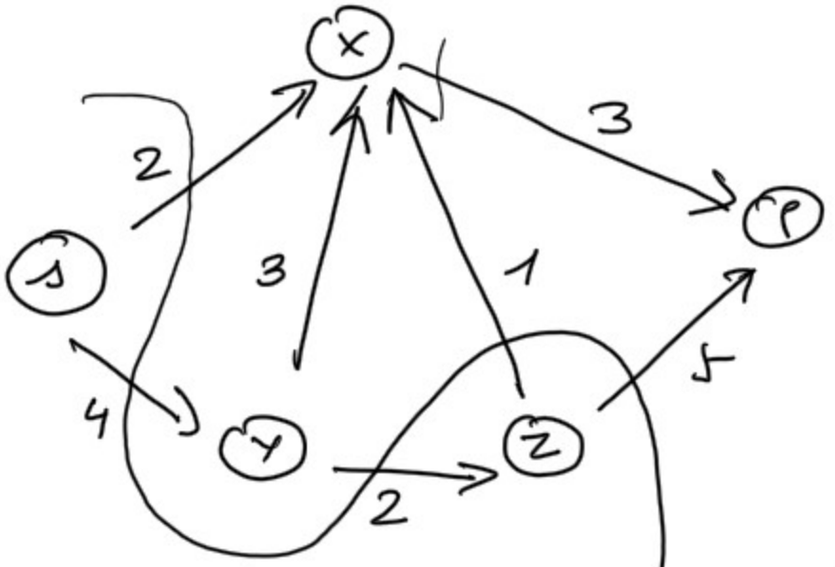
S

$c(S, \bar{S}) = 39$

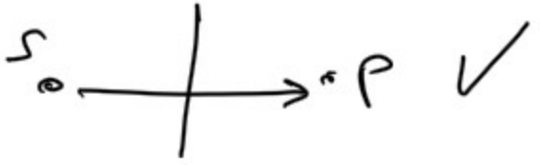
$v(f) = 39$

$\longrightarrow$

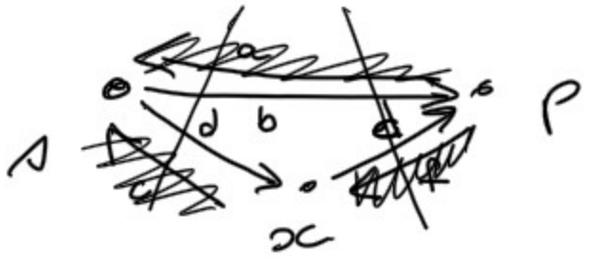
$\longleftarrow$ f_0



$n=2$



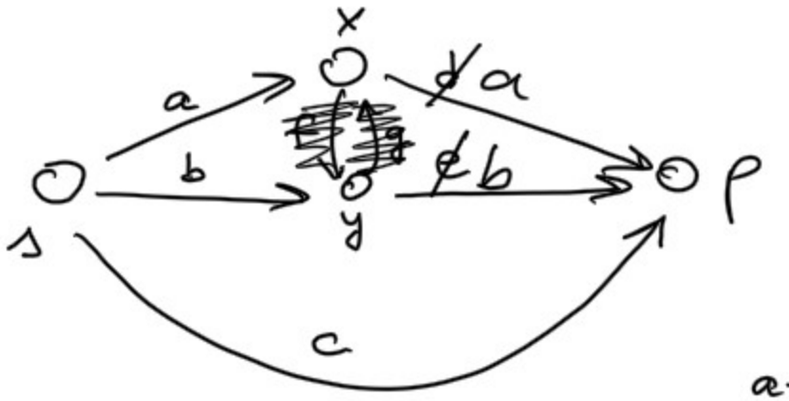
$n=3$



S	$\bar{S}$	cap.	
s	x, p	b+d	b+d
s, x	p	b+e	
		d=e	

Coupe		
S	$\bar{S}$	Capacité
s	x, y, z, p	6
s, x, y, z	p	8
s, x	y, z, p	7
s, y	x, z, p	7
s, z	x, y, p	12
s, x, y	z, p	5
s, x, z	y, p	12
s, y, z	x, p	11

$n=4$



$c_1 + c_2 + \cdots + c_{n-1}$

S	$\overline{S}$	espacité
s	x, y, p	$a+b+c$
s, x	y, p	$b+c+d+f$
s, y	x, p	$a+c+e+g$
s, x, y	p	$c+d+e$

$a+b+c = b+c+d+f$

$\boxed{a = d+f}$

$a+c+e+g = c+d+e$

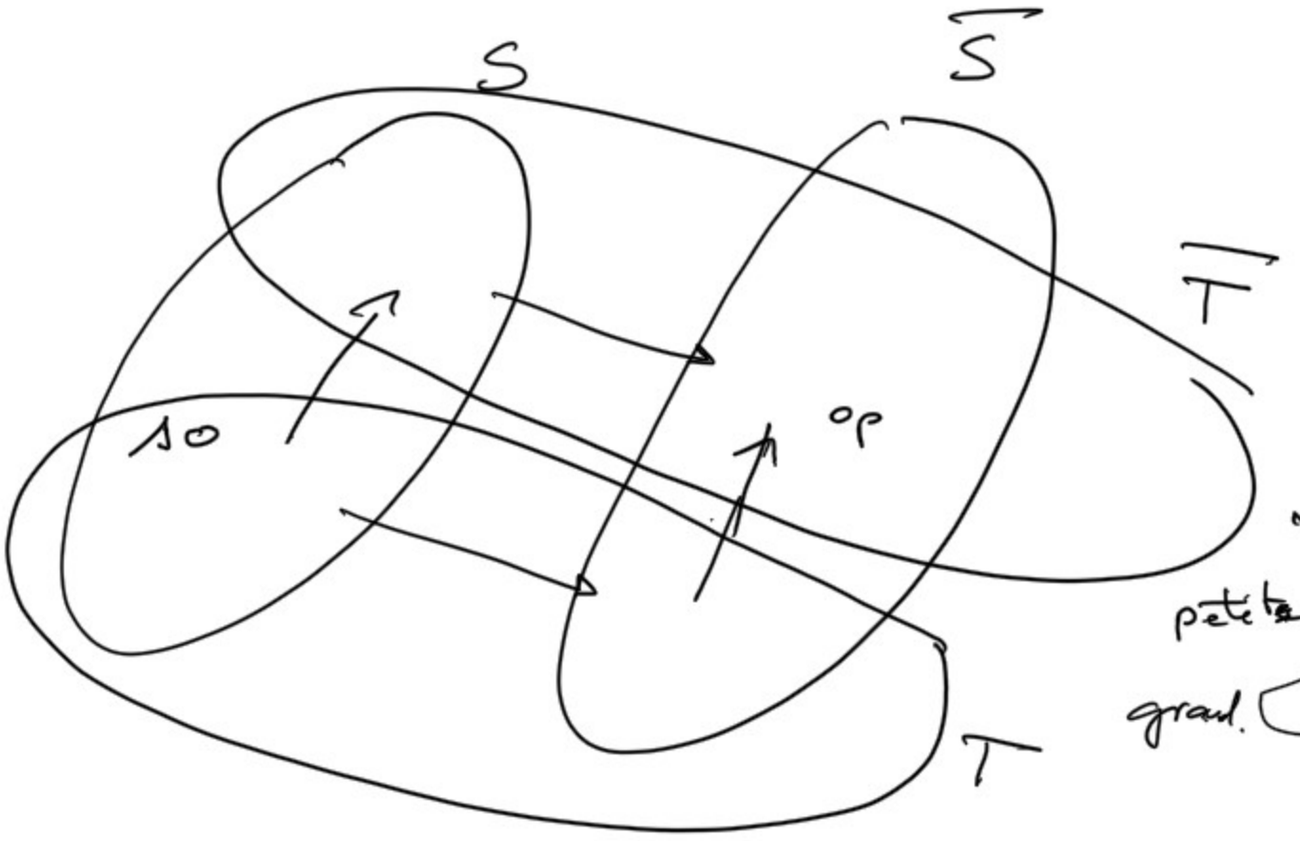
$\boxed{d = a+g}$

$a \geq d$, $a \leq d \Rightarrow \underline{a=d}$

$\underline{f=g=0}$

$c+d+e = a+c+e = a+b+c$

$b=e$



$S_1, \overline{S_1}$

$S_2, \overline{S_2}$

$S_3, \overline{S_3}$

$\vdots$

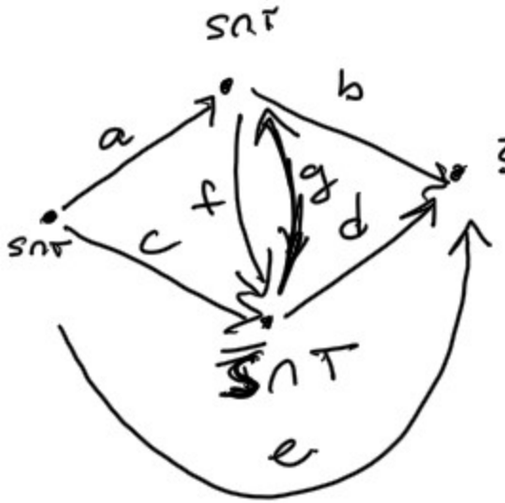
$S_k, \overline{S_k}$

petite : $S_1 \cap S_2 \cap \dots \cap S_k$, $\overline{S_1 \cap \dots \cap S_k}$

grand : $S_1 \cup S_2 \cup \dots \cup S_k$, $\overline{S_1 \cup \dots \cup S_k}$

$$c(S, \overline{S}) = b + c + e + f$$
$$c(T, \overline{T}) = a + d + e + g$$

$\Big\}$ min



$\overline{S} \cap \overline{T}$ $c(S \cap T, \overline{S \cap T}) = a + c + e$

$c(S \cup T, \overline{S \cup T}) = b + d + e$

$\Big\}$ $\geq$

$a + b + c + d + 2e \geq a + b + c + d + 2e + f + g$

$\Rightarrow f = g = 0$ et on a égalité

$S \to 1 \to 4 \to 8 \to 12 \to 14 \to P : 8$

$S \to 1 \to 3 \to 7 \to 11 \to 13 \to P : 7$

$S \to 2 \to 5 \to 9 \to 12 \to 14 \to P : 6$

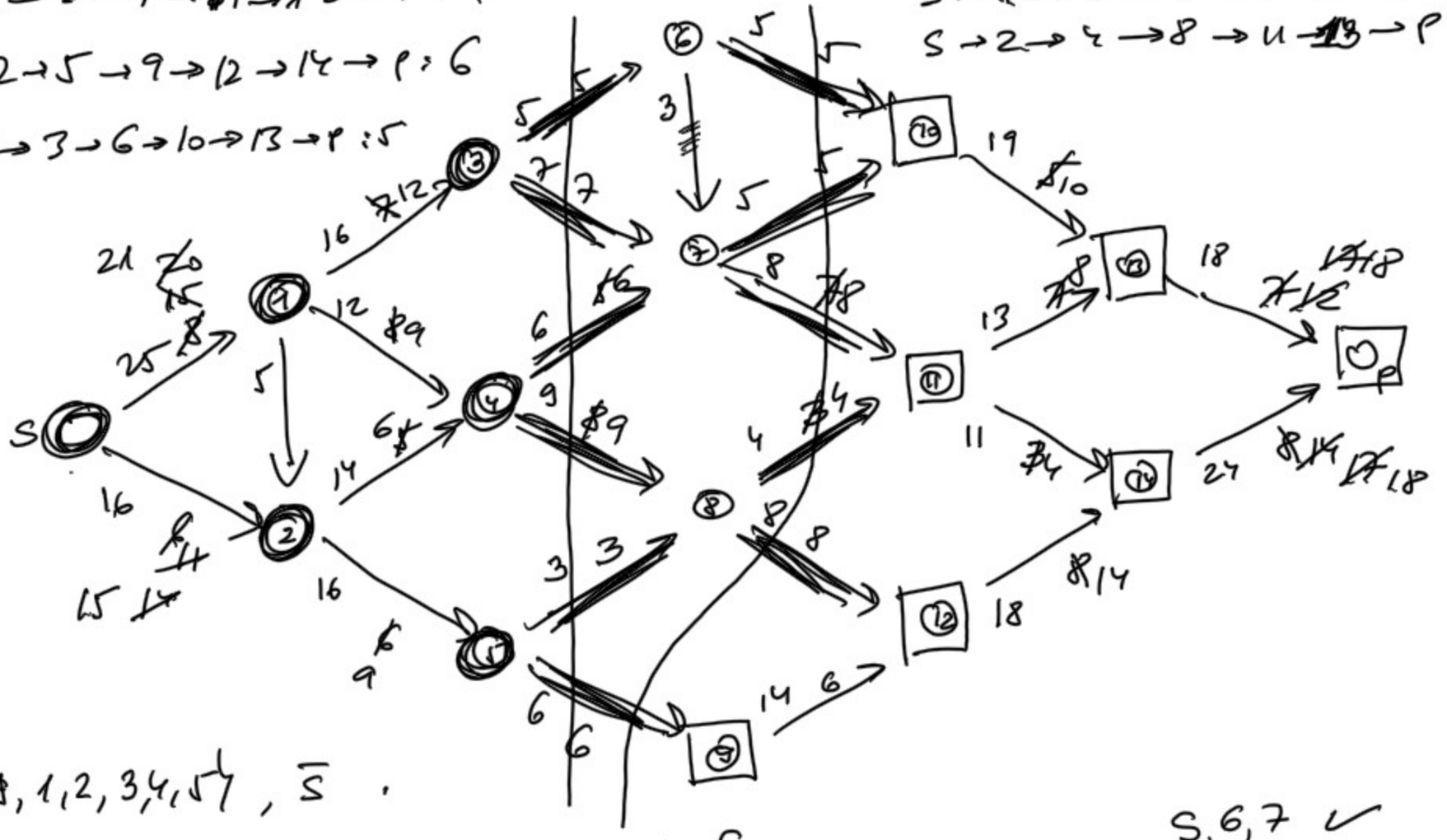
$S \to 1 \to 3 \to 6 \to 10 \to 13 \to P : 5$

$S \to 2 \to 4 \to 7 \to 10 \to 13 : 5$

$S \to 2 \to 5 \to 8 \to 11 \to 14 \to P : 3$

$S \to 1 \to 4 \to 7 \to 11 \to 14 \to P : 1$

$S \to 2 \to 4 \to 8 \to 11 \to 13 \to P : 1$



$S = \{S, 1, 2, 3, 4, 5\}$, $\overline{S}$.

$T = \{S, 1, 2, 3, 4, 5, 6, 7, 8\}$, $\overline{T}$.

* S

~~S, 6~~

S, 7 ✓

S, 8 ✓

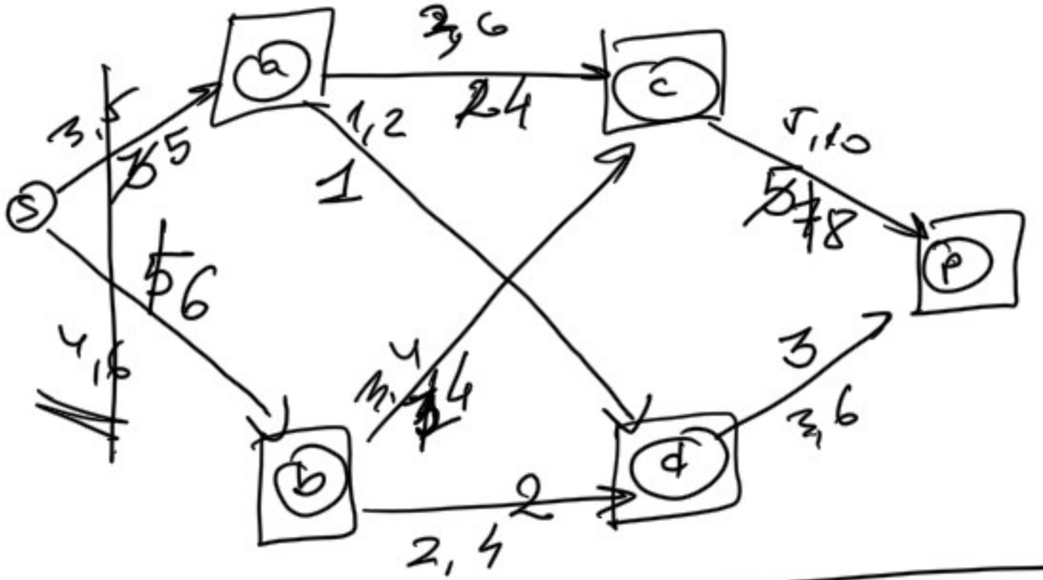
S, 6, 7 ✓

~~S, 6, 8~~

S, 7, 8

* S, 6, 78 = T !

6 coupes de capacité minimum.



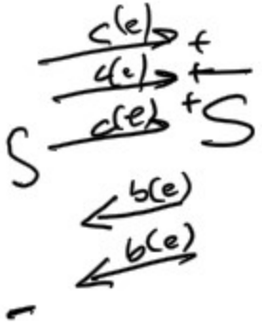
$S \xrightarrow{2} a \xrightarrow{4} c \xrightarrow{5} p : 2$

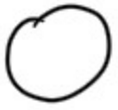
$S \xrightarrow{1} b \xrightarrow{1} c \xrightarrow{3} p : 1$

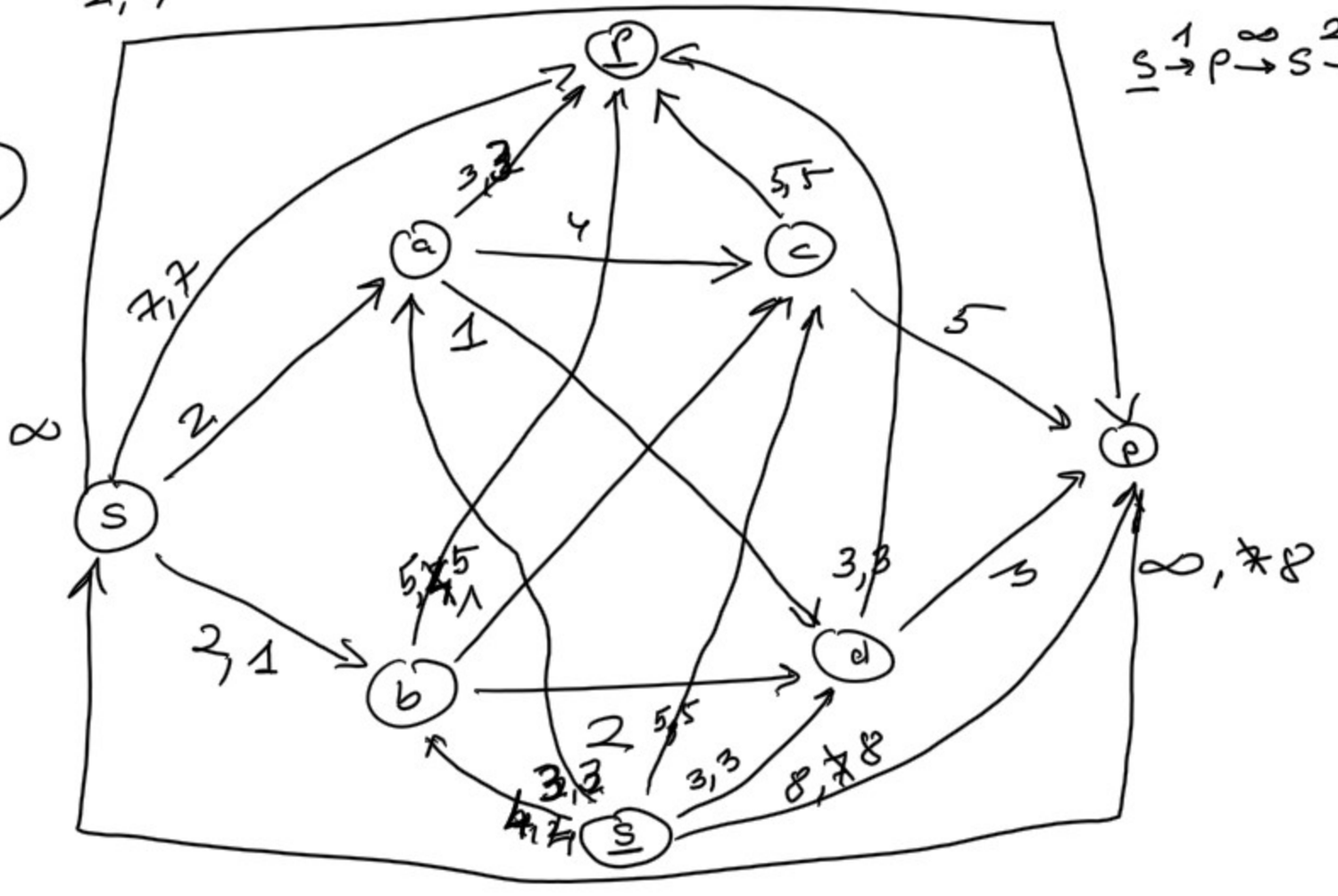
$S = \{1\}$ $\bar{S} = \{a, b, c, d, p\}$

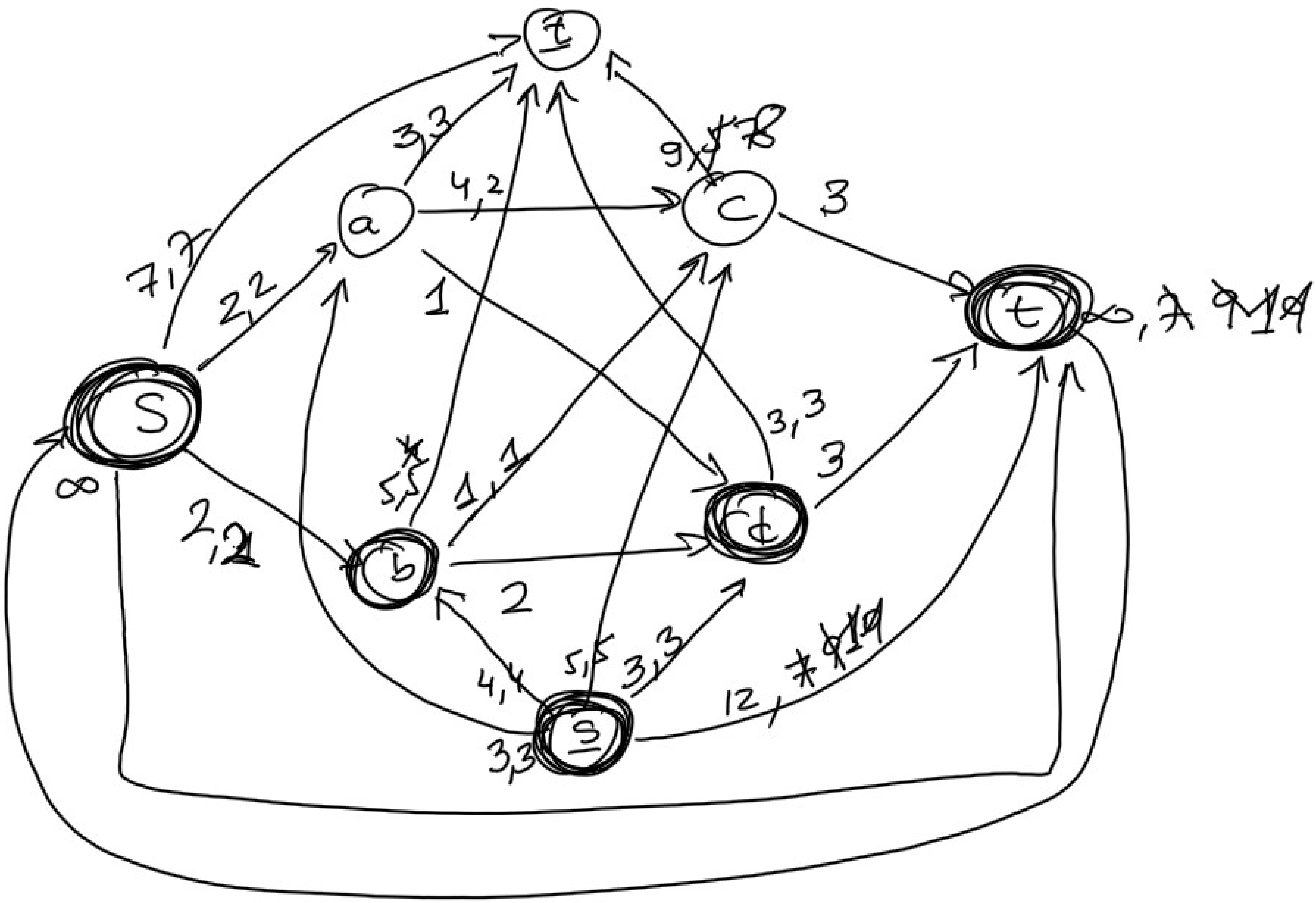
unique

$\underline{S} \xrightarrow{1} p \xrightarrow{\infty} S \xrightarrow{2} b \xrightarrow{1} \underline{p}$

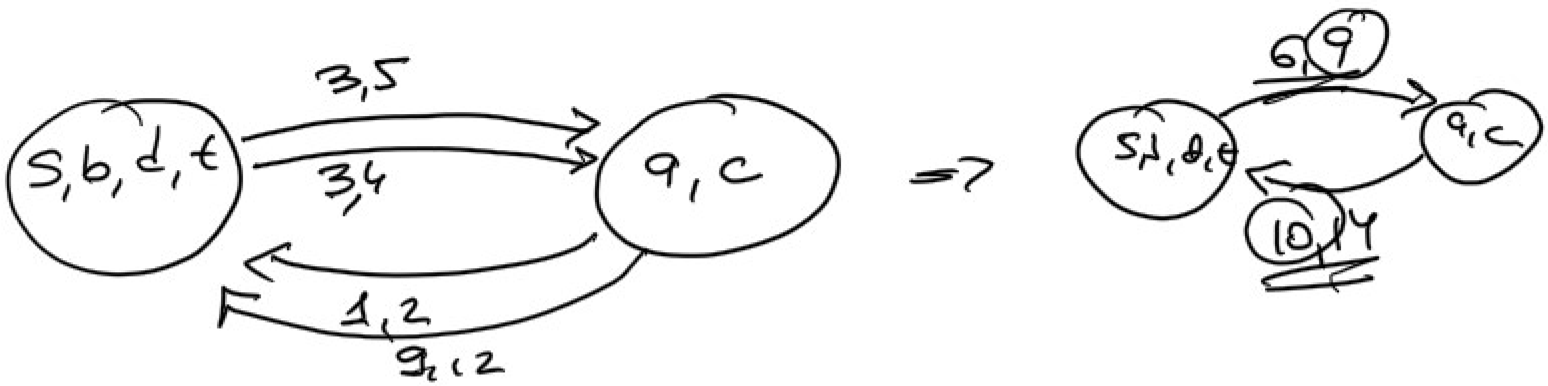




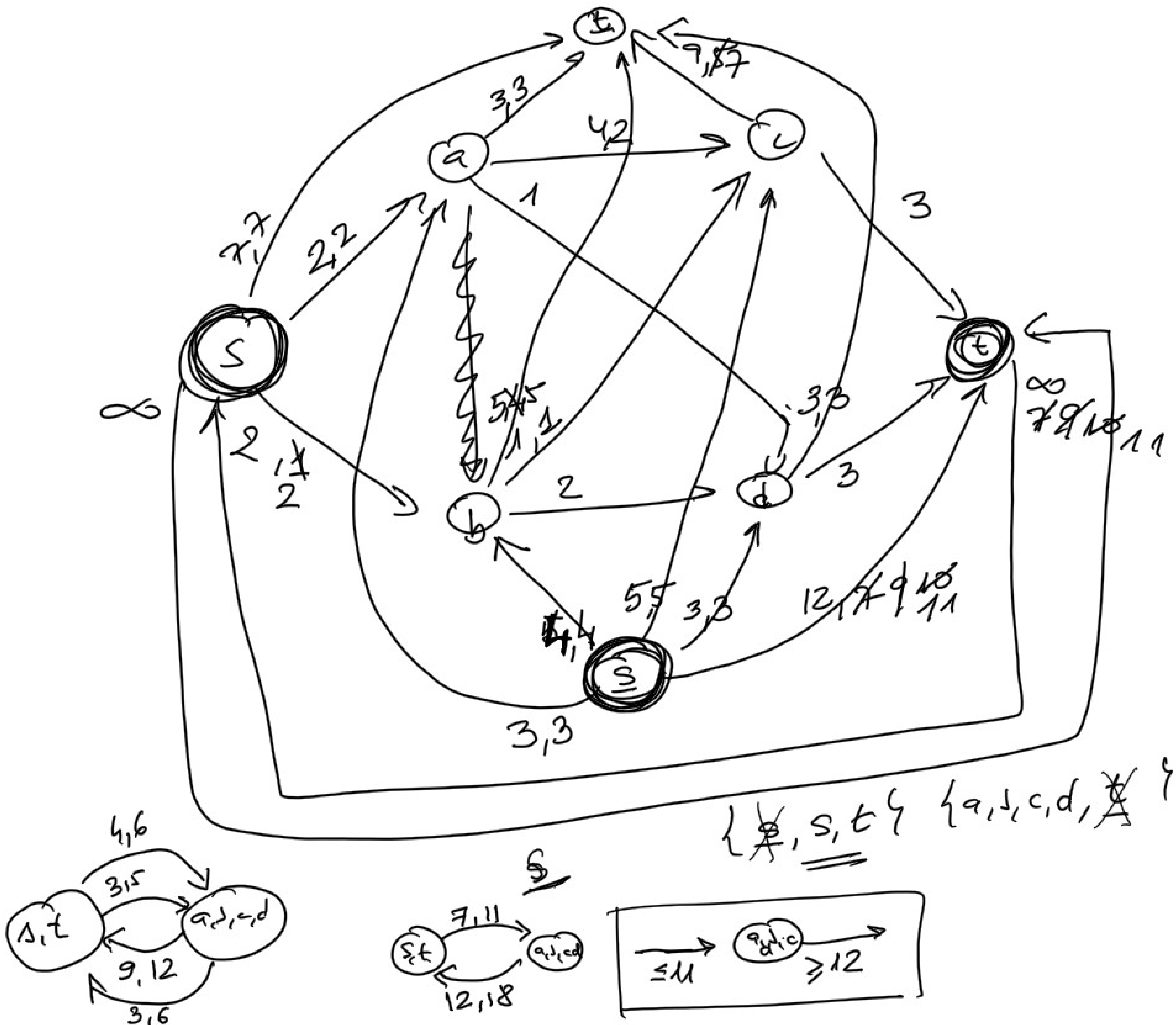




S
a
c
t
b
d
3,3
4,2
2,2
3
1
2
3,3
3,3
5,5
4,4
∞



s,b,d,t
a,c
3,5
3,4
1,2
9,12
=>


4,6
3,5
9,12
3,6
7,11
12,18
≤11
≥12