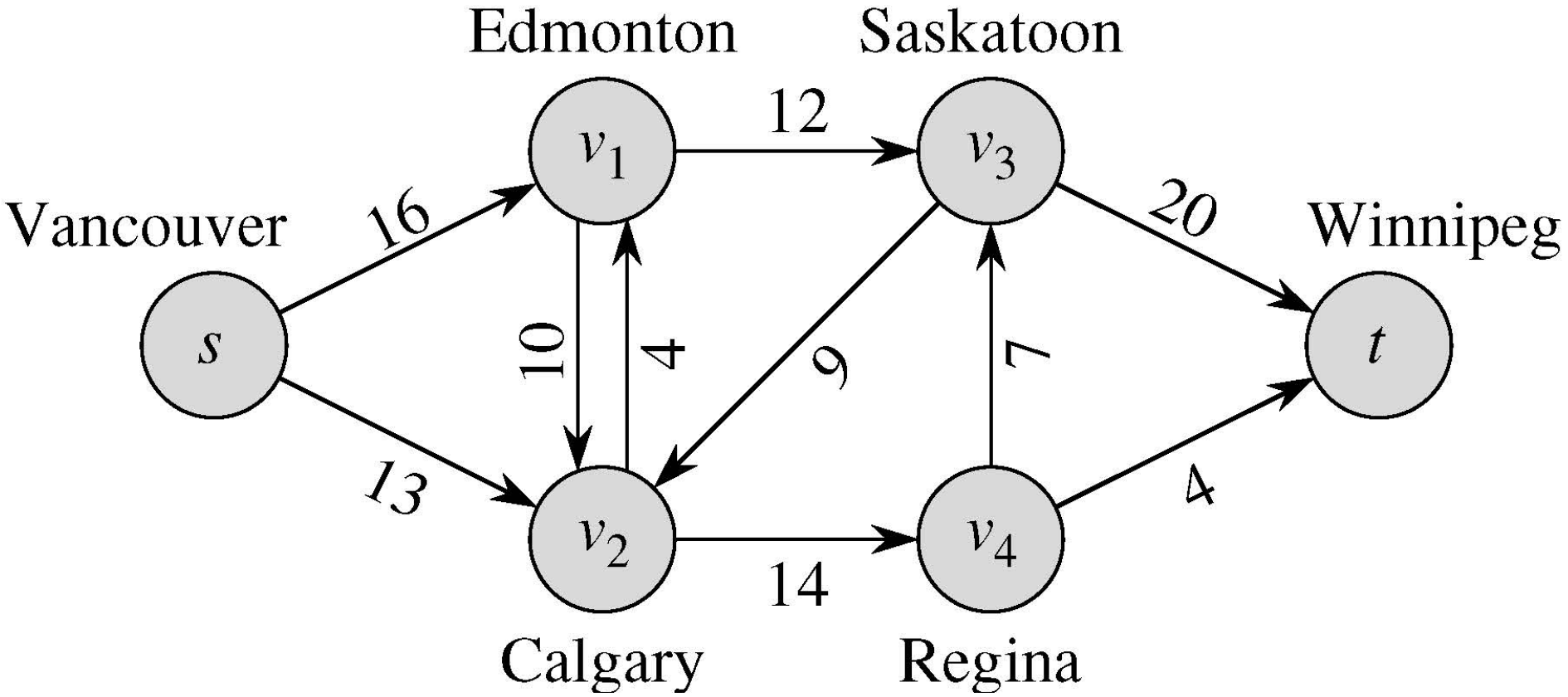
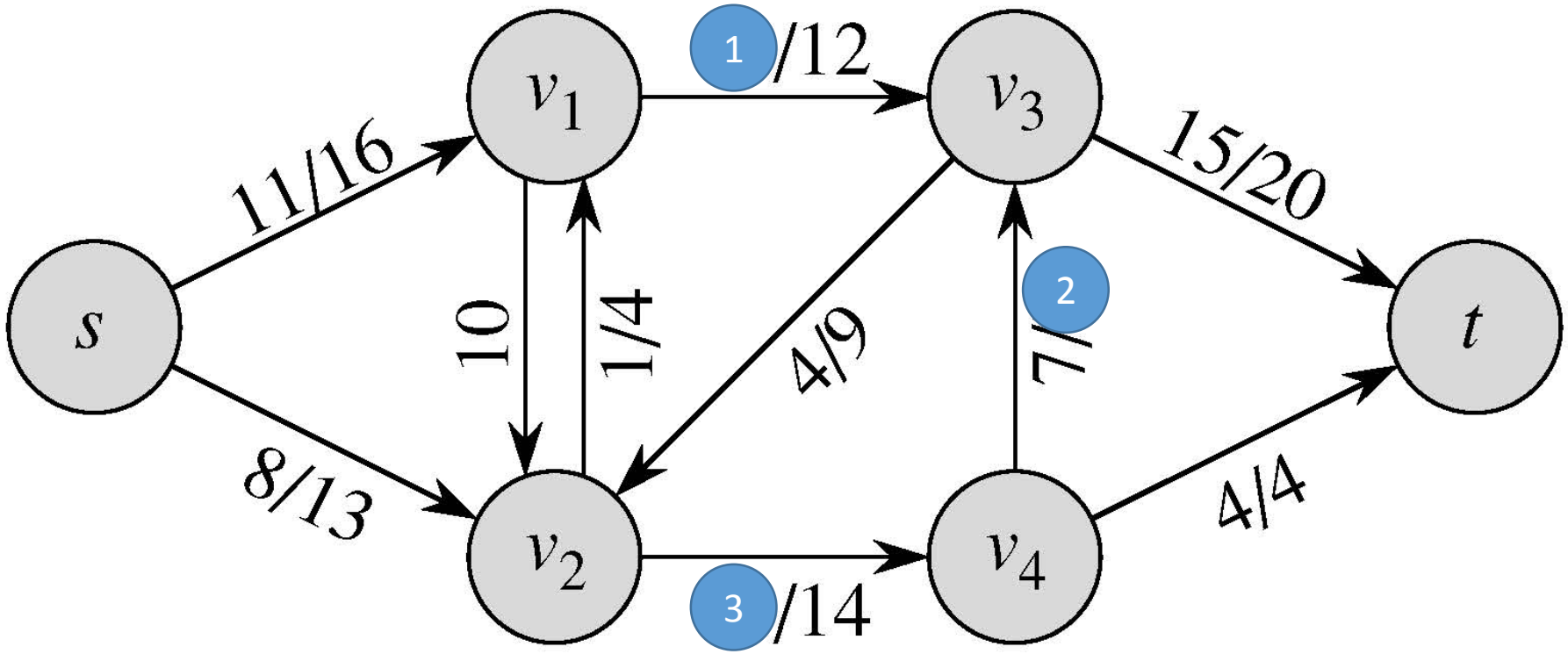
Maximale Fluesse

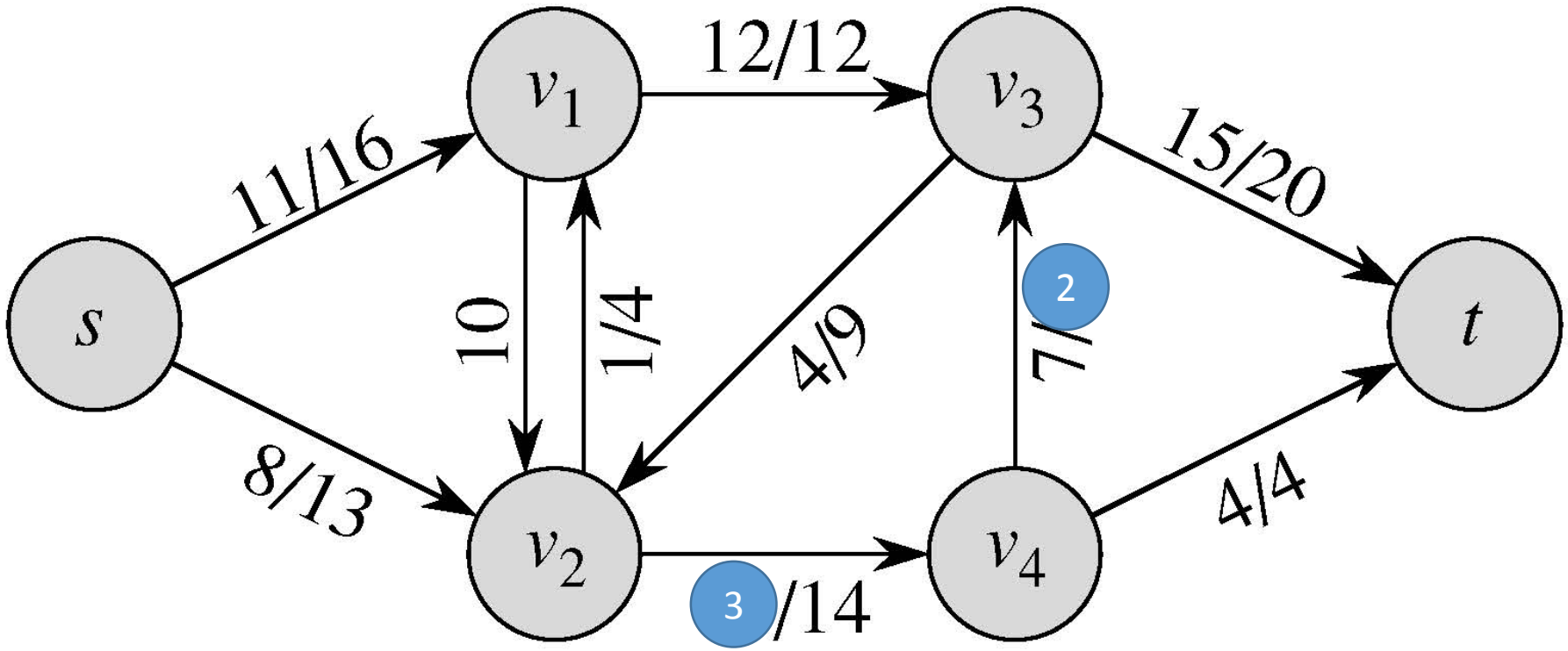
Beispiel Flussnetzwerk



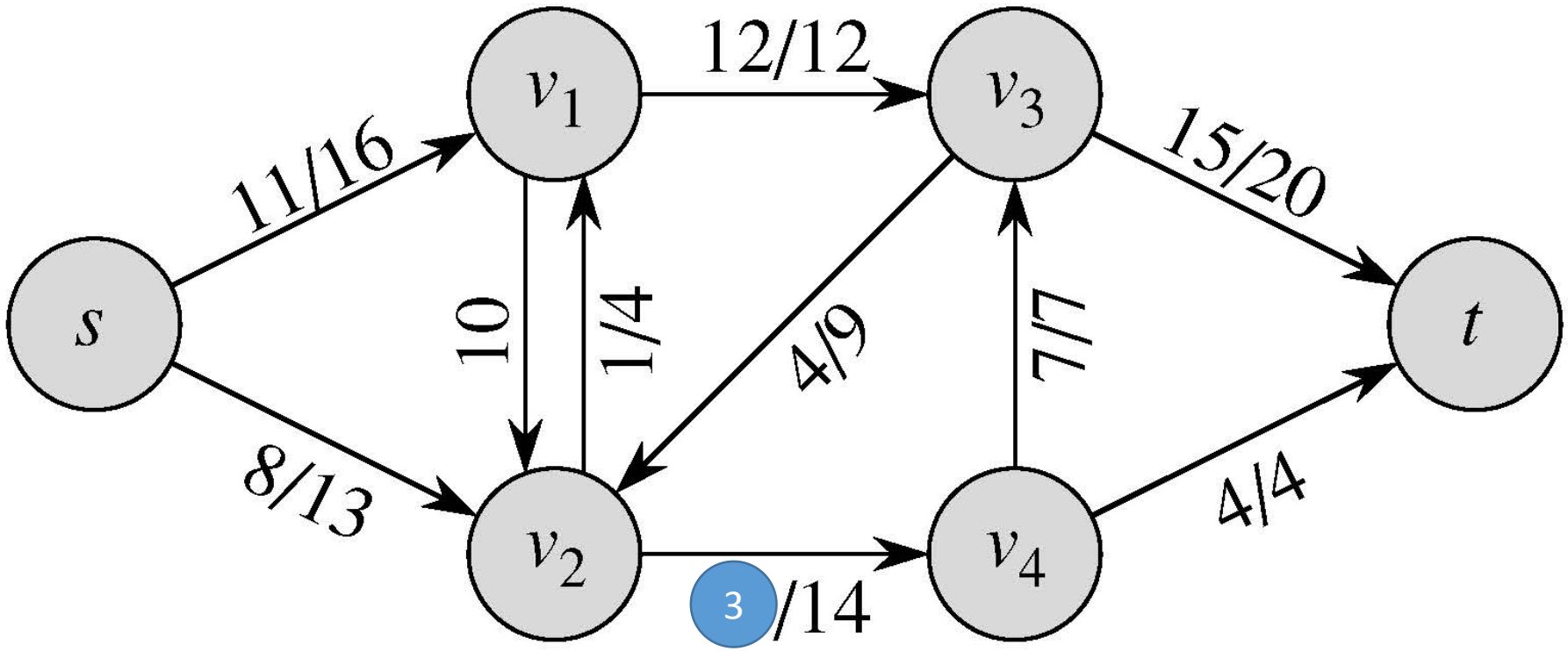
Beispiel für Fluss



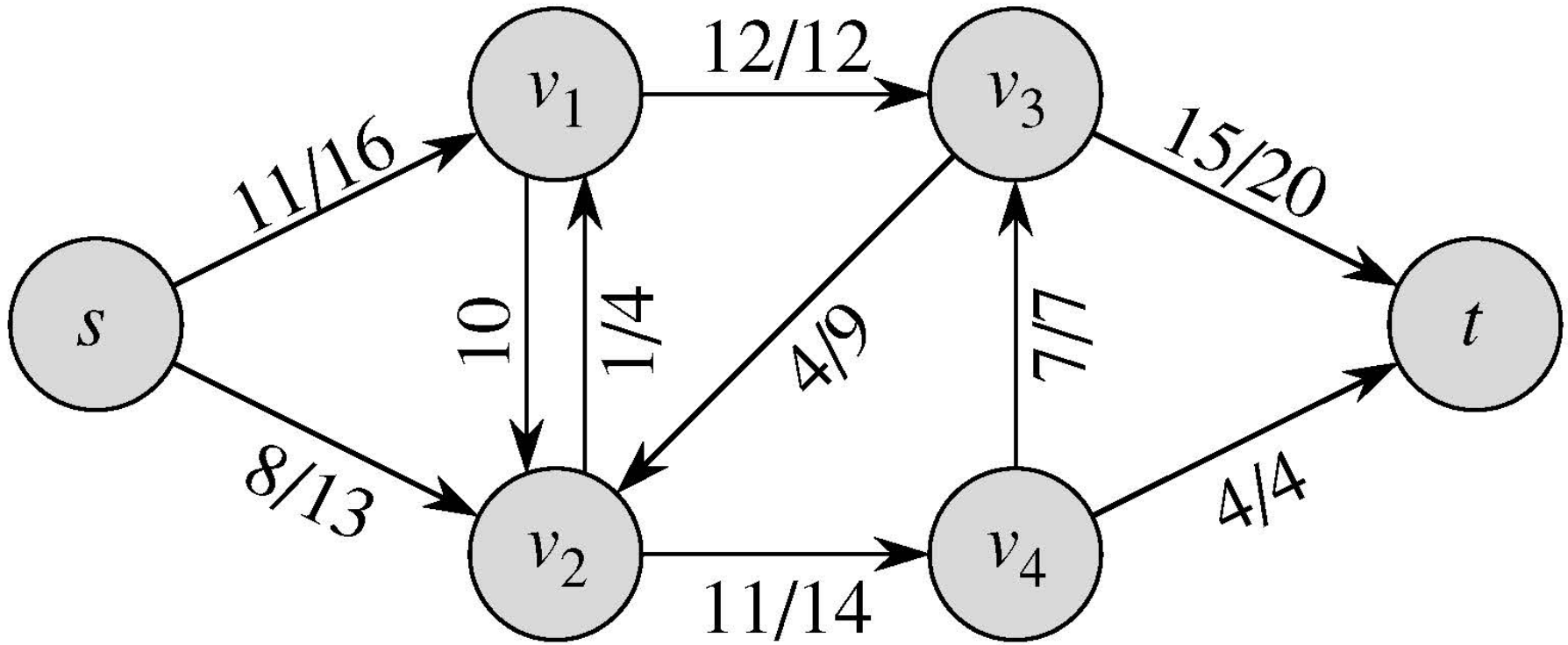
Beispiel für Fluss



Beispiel für Fluss



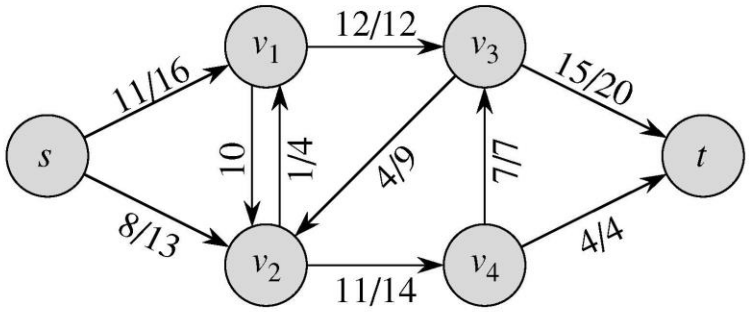
Beispiel für Fluss



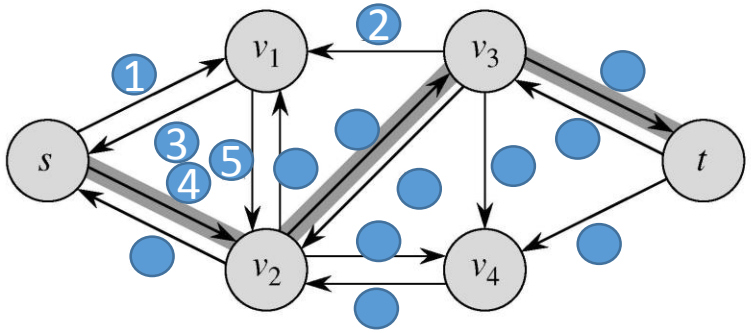
FORD-FULKERSON-METHOD(G, s, t)

```
1   initialize flow f to 0
2   while there exists an augmenting path p
3       do augment flow f along p
4   return f
```

Restkapazität



(a)

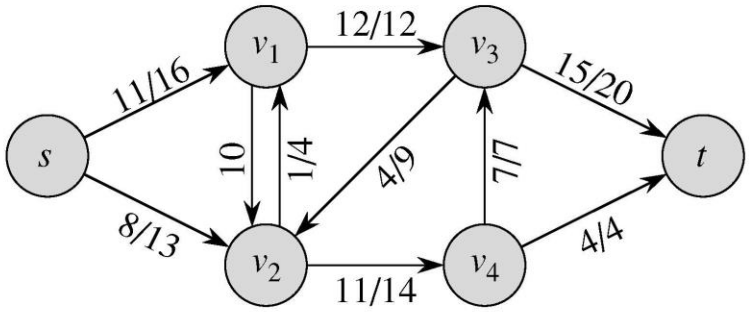


(b)

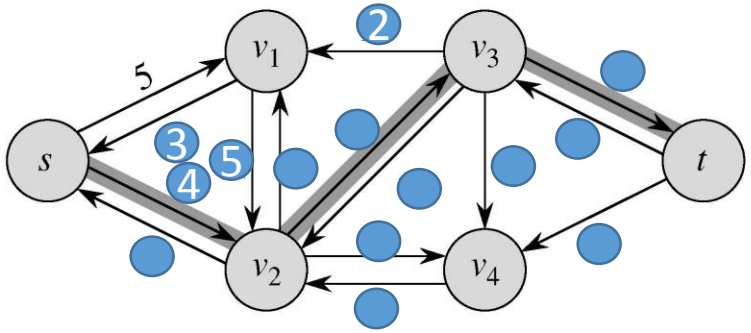
(c)

(d)

Restkapazität



(a)

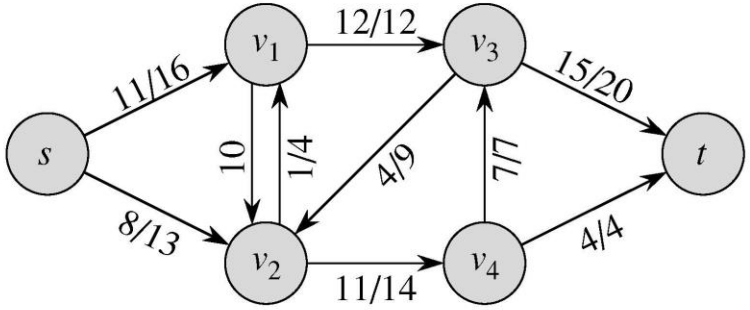


(b)

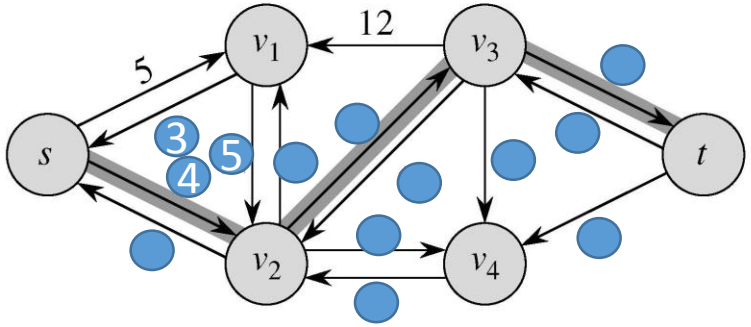
(c)

(d)

Restkapazität



(a)

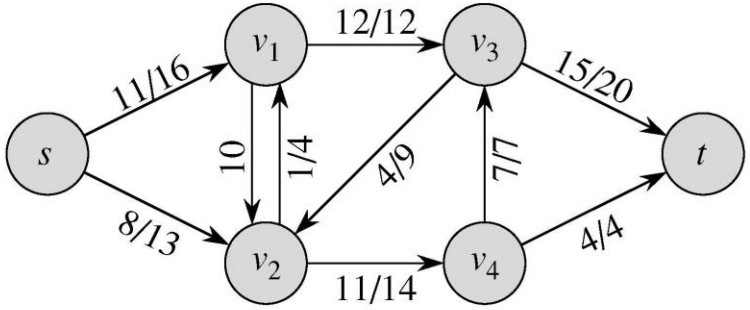


(b)

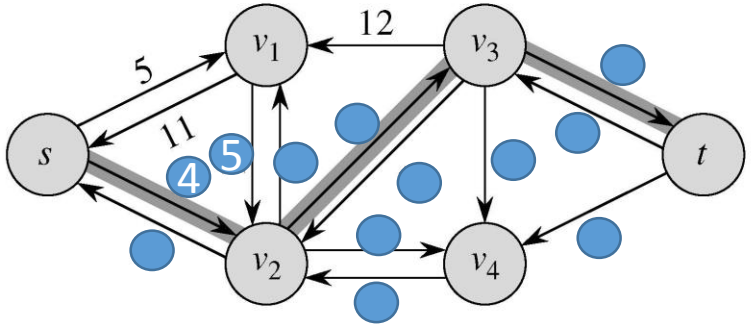
(c)

(d)

Restkapazität



(a)

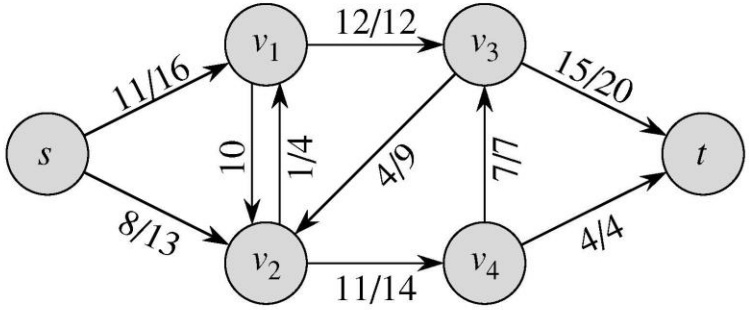


(b)

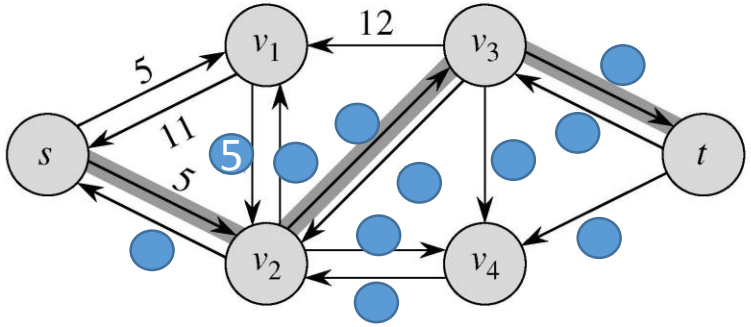
(c)

(d)

Restkapazität



(a)

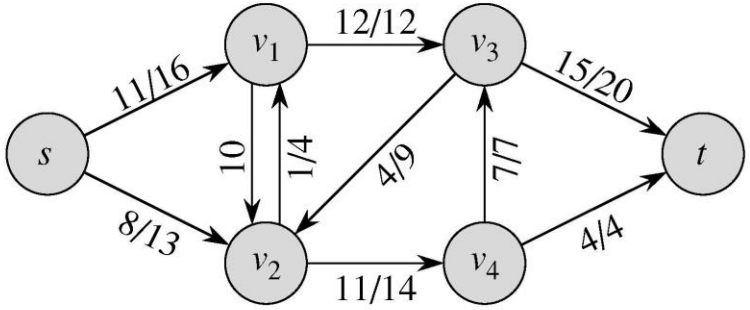


(b)

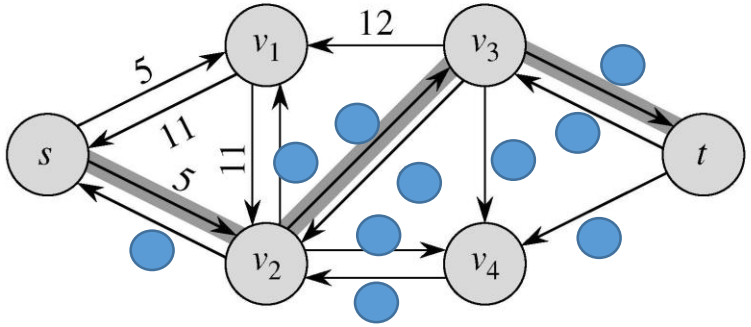
(c)

(d)

Restkapazität



(a)

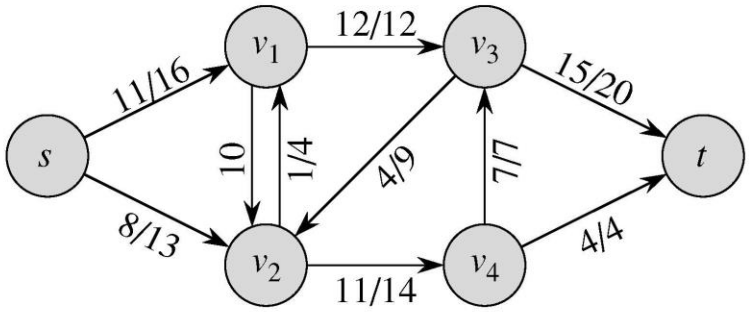


(b)

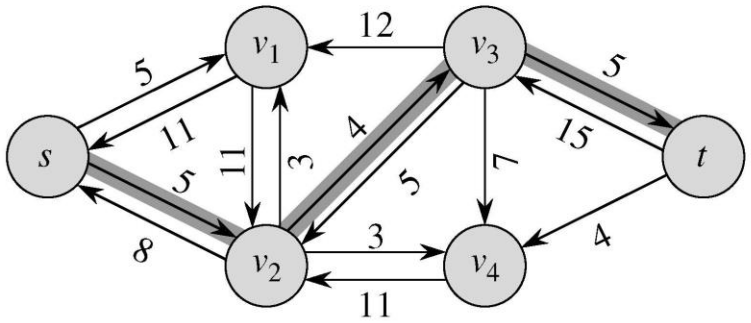
(c)

(d)

$f + f_p$


s
v_1
v_2
v_3
v_4
t
11/16
8/13
12/12
10
1/4
4/9
7/7
15/20
4/4
11/14

(a)

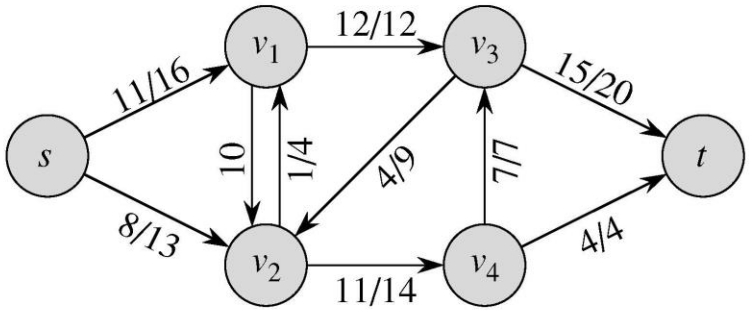

s
v_1
v_2
v_3
v_4
t
5
11
5
11
3
12
4
5
7
5
15
3
4
8
11

(b)

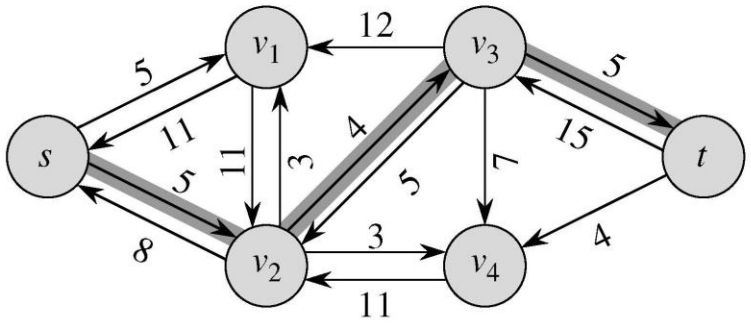
(c)

(d)

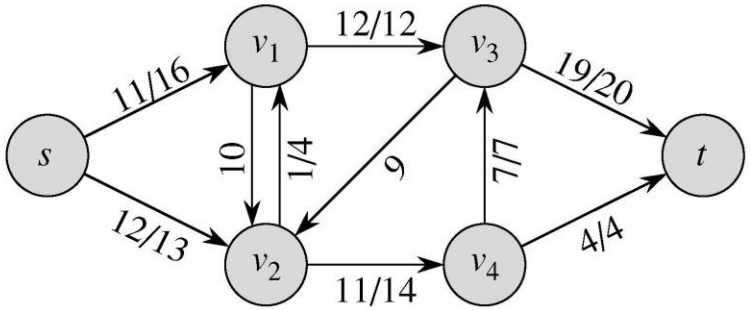
$f + f_p$


v_1
v_3
s
t
v_2
v_4
12/12
11/16
15/20
10
1/4
4/9
7/7
8/13
4/4
11/14

(a)


v_1
v_3
s
t
v_2
v_4
12
5
11
5
11
3
4
5
7
15
5
8
3
4
11

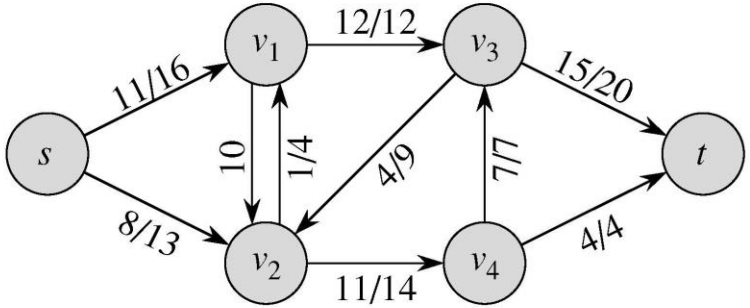
(b)


v_1
v_3
s
t
v_2
v_4
12/12
11/16
19/20
10
1/4
9
7/7
12/13
4/4
11/14

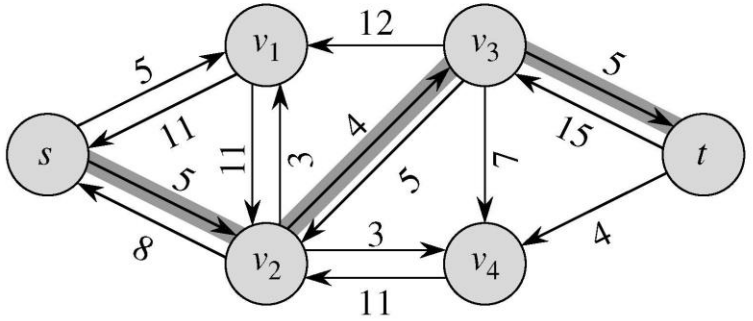
(c)

(d)

Neues Restnetzwerk



(a)



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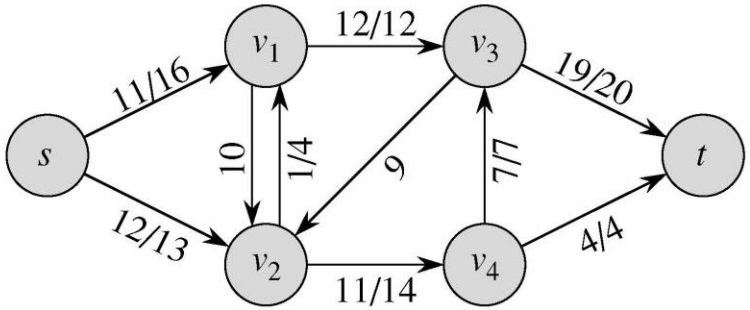
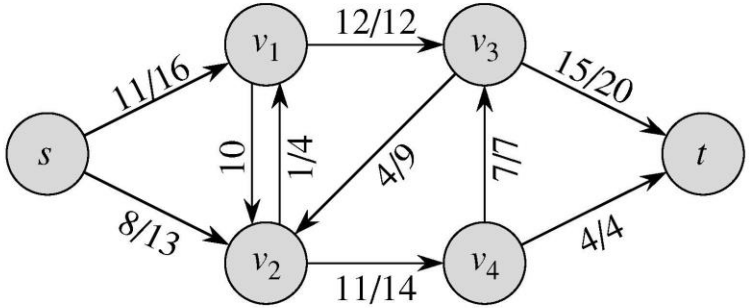


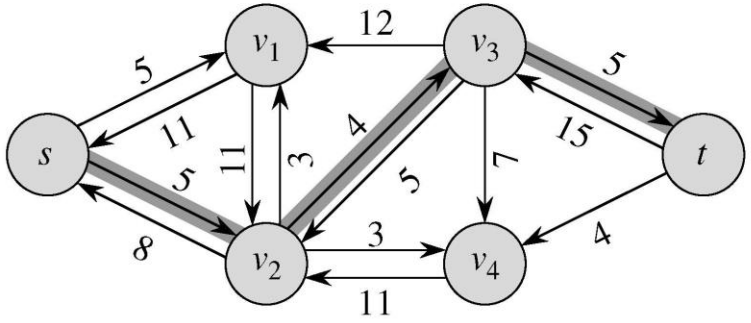
(c)

(d)

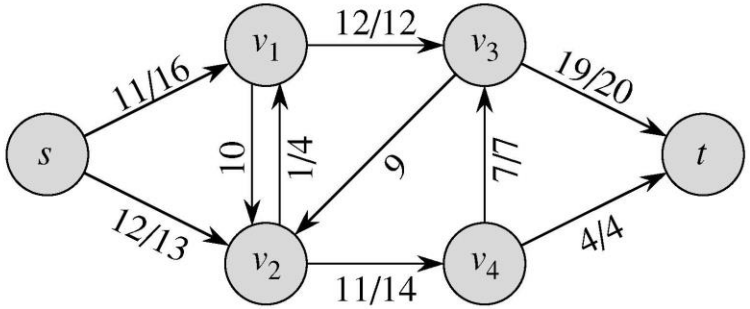
Neues Restnetzwerk



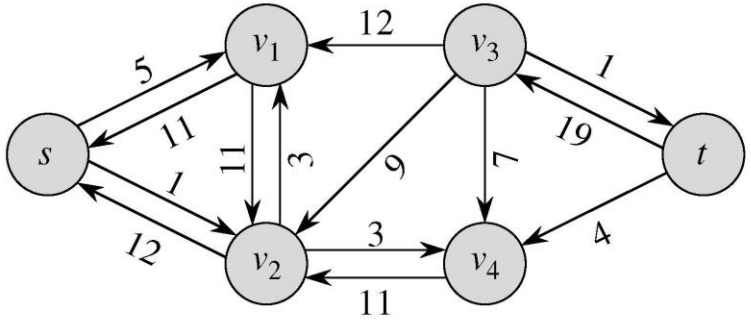
(a)



(b)

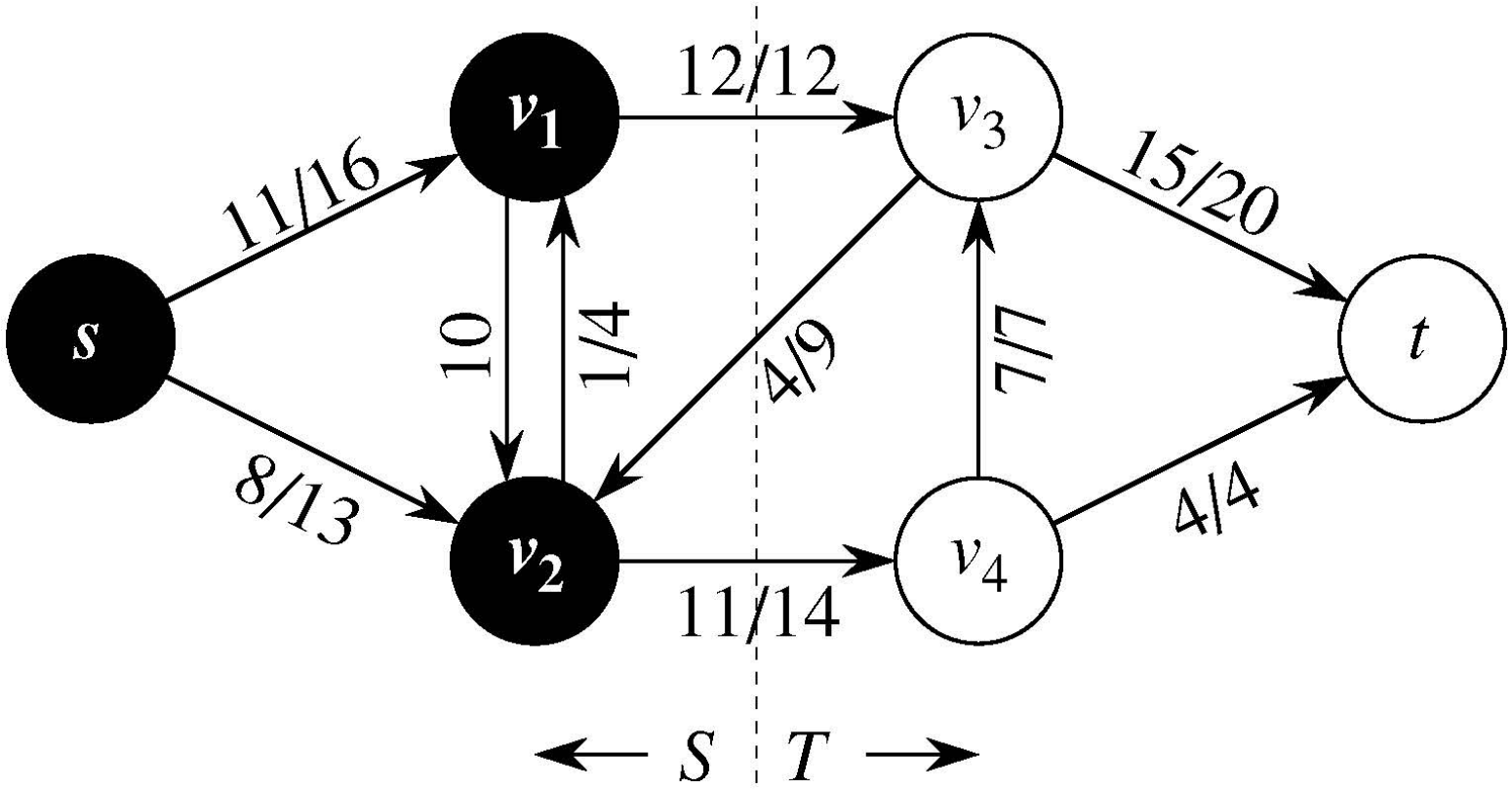


(c)



(d)

Schnitt



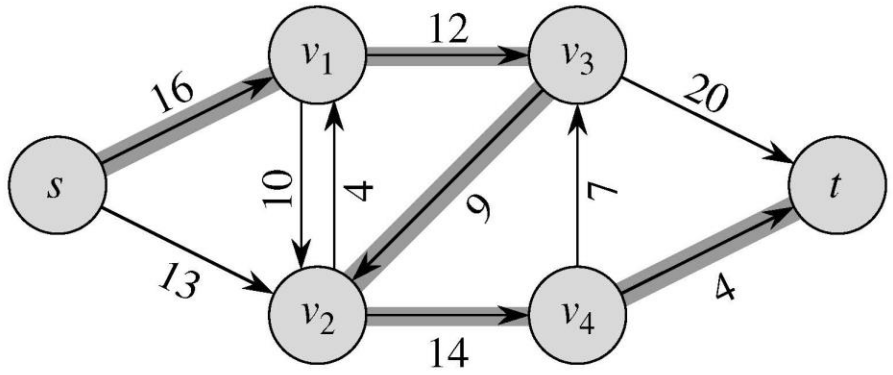
Ford-Fulkerson Algorithmus

FORD-FULKERSON(G, s, t)

1 **for** each edge $(u, v) \in E[G]$
2 **do** $f[u, v] \leftarrow 0$
3 $f[v, u] \leftarrow 0$
4 **while** there exists a path p from s to t in the residual network G_f
5 **do** $c_f(p) \leftarrow \min\{c_f(u, v) : (u, v)$ is in $p\}$
6 **for** each edge (u, v) in p
7 **do** $f[u, v] \leftarrow f[u, v] + c_f(p)$
8 $f[v, u] \leftarrow -f[u, v]$

Ford-Fulkerson: Ausgangsfluss f=0
Pfad in Restnetzwerk

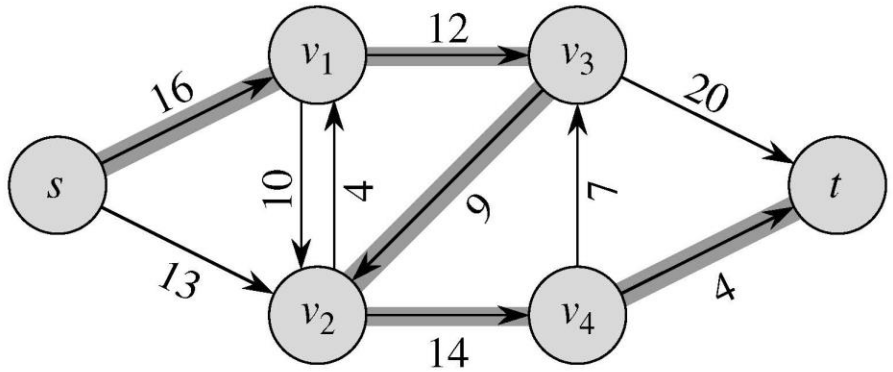
(a)

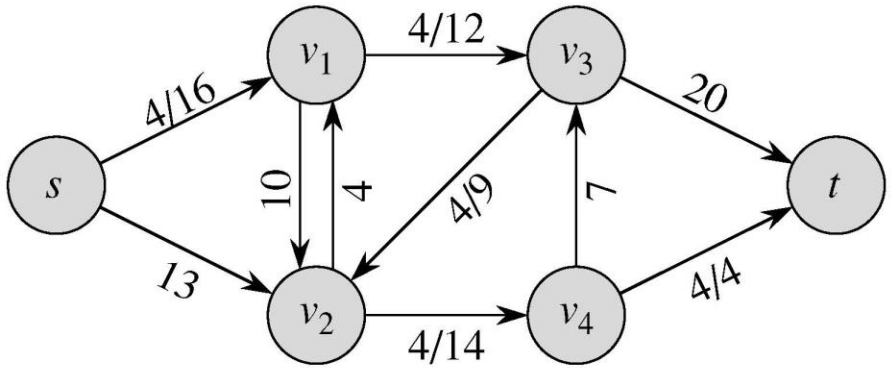


(b)

Ford-Fulkerson: Neuer Fluss

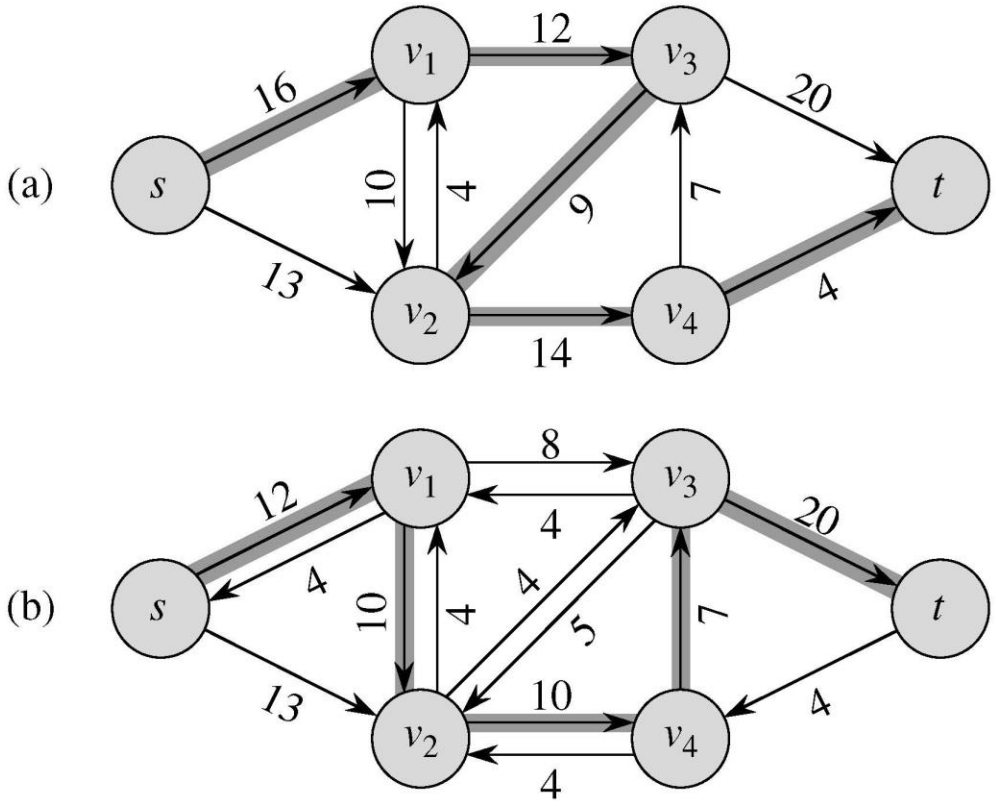
(a)

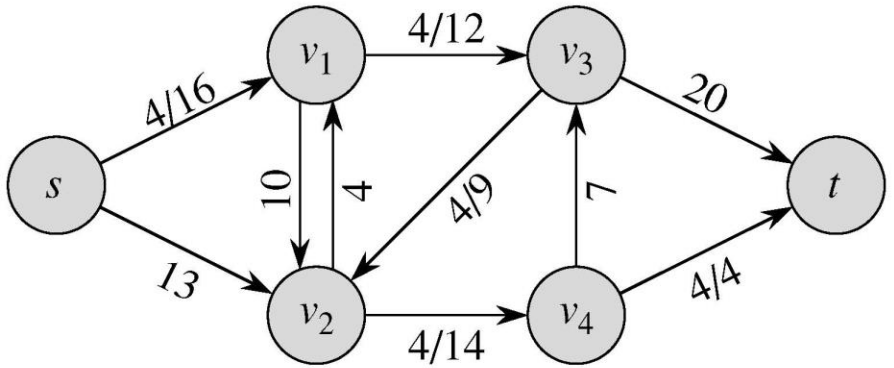




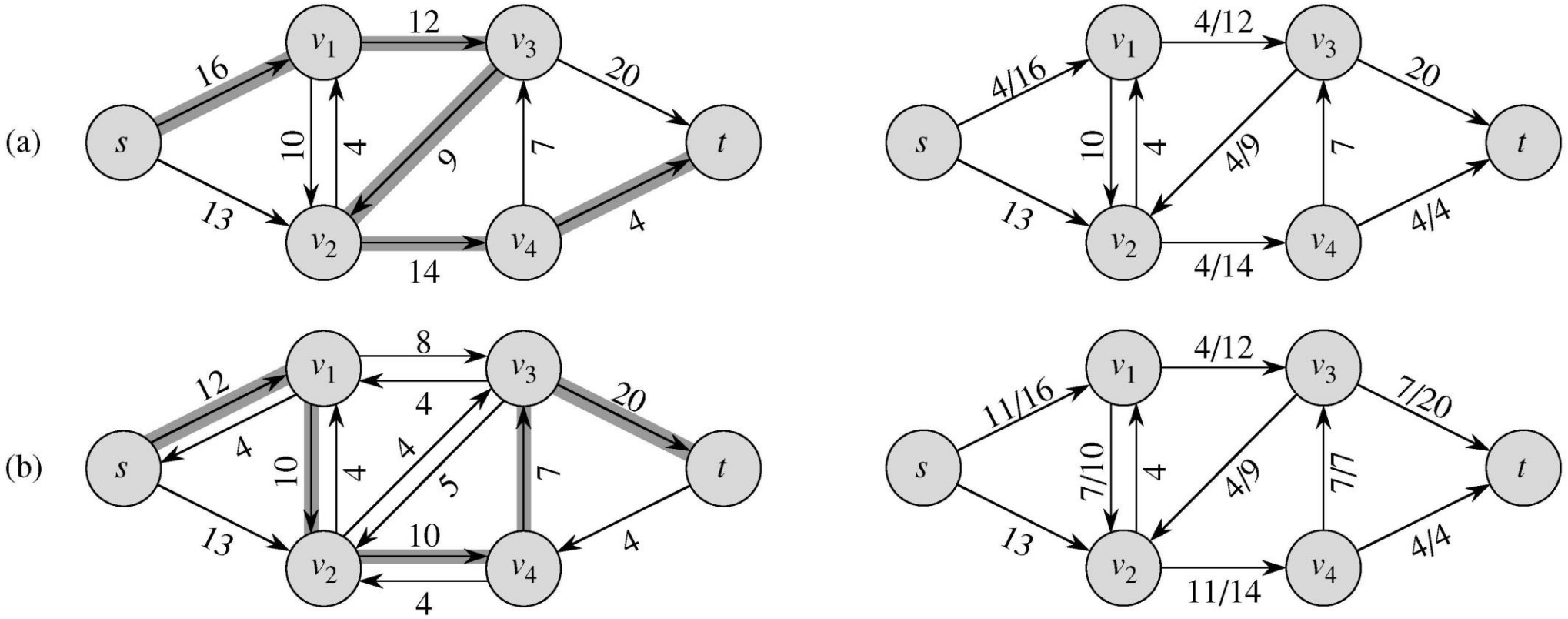
(b)

Ford-Fulkerson: Neues Restnetzwerk und Pfad in diesem

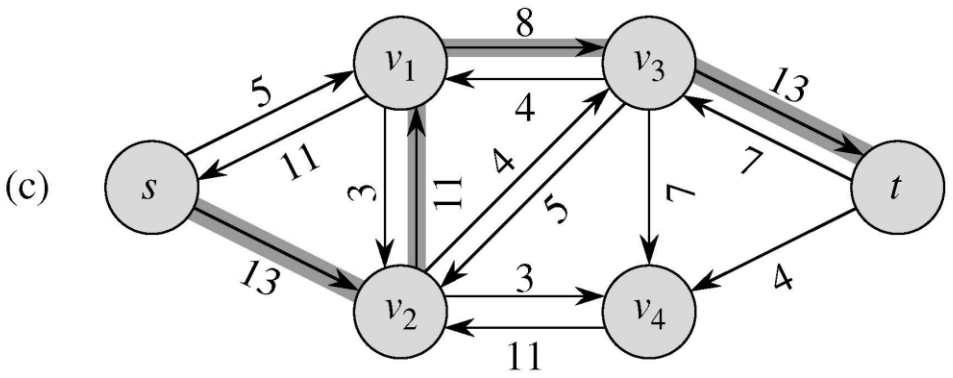


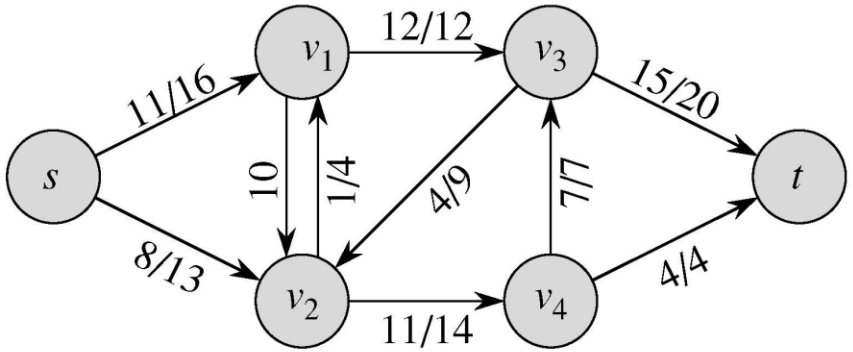


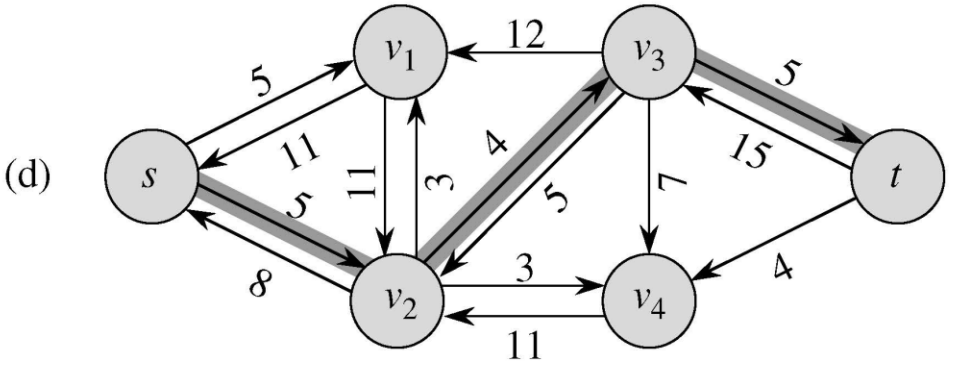
Ford-Fulkerson: Neuer Fluss

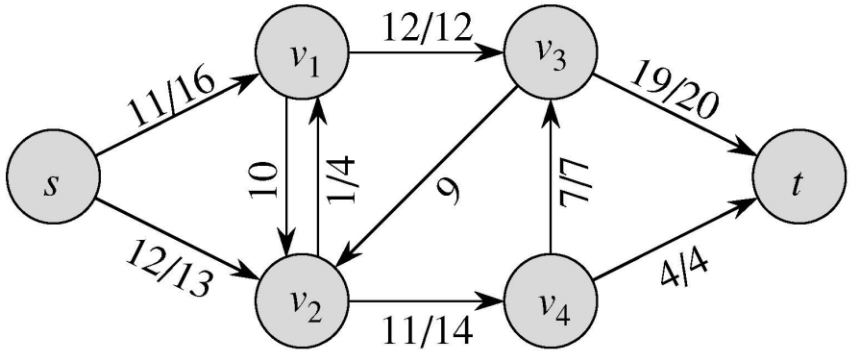


Ford-Fulkerson: Restnetzwerke/Pfade – neue Flüsse

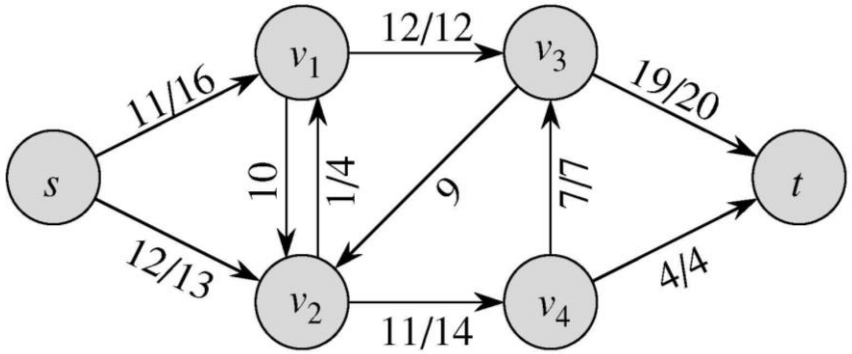




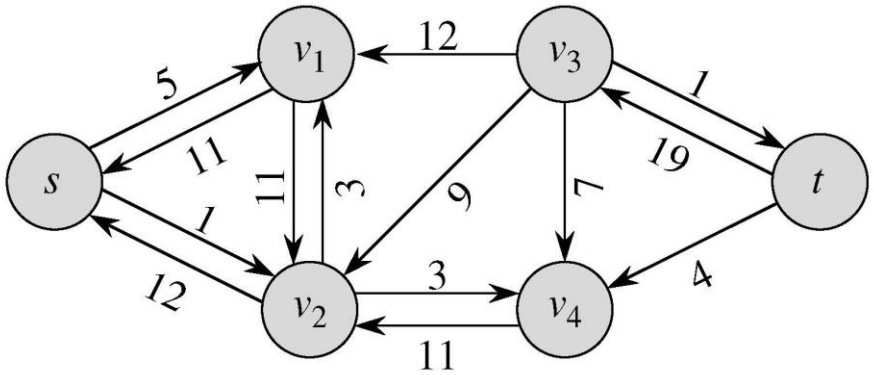




Ford-Fulkerson: Neues Restnetzwerk ohne Pfad



(e)



Ford-Fulkerson Worst Case