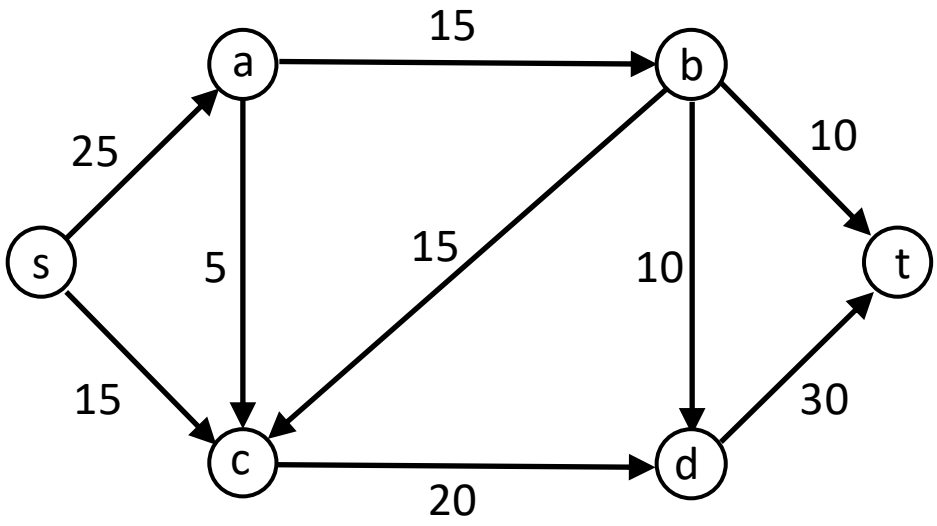
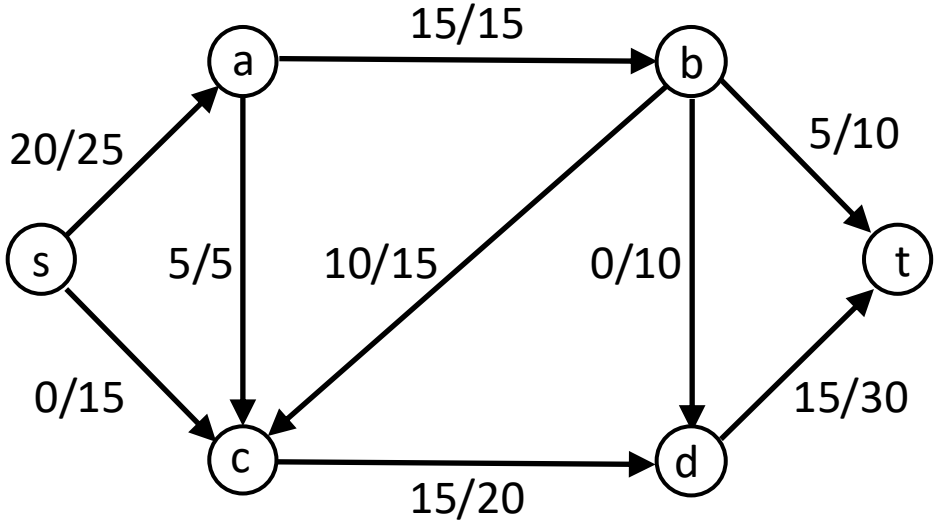
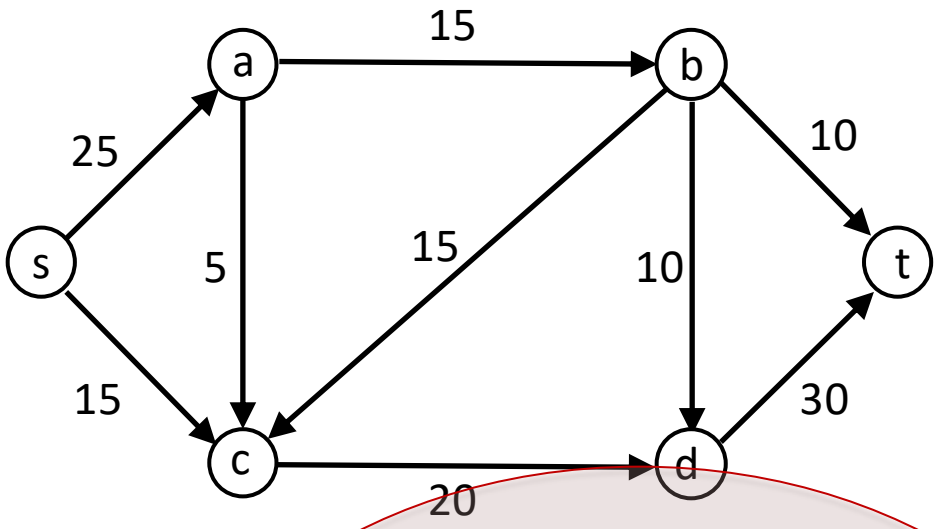
A flow network $\mathcal{F}$



A flow f in the network $\mathcal{F}$
$V(f) = 20$

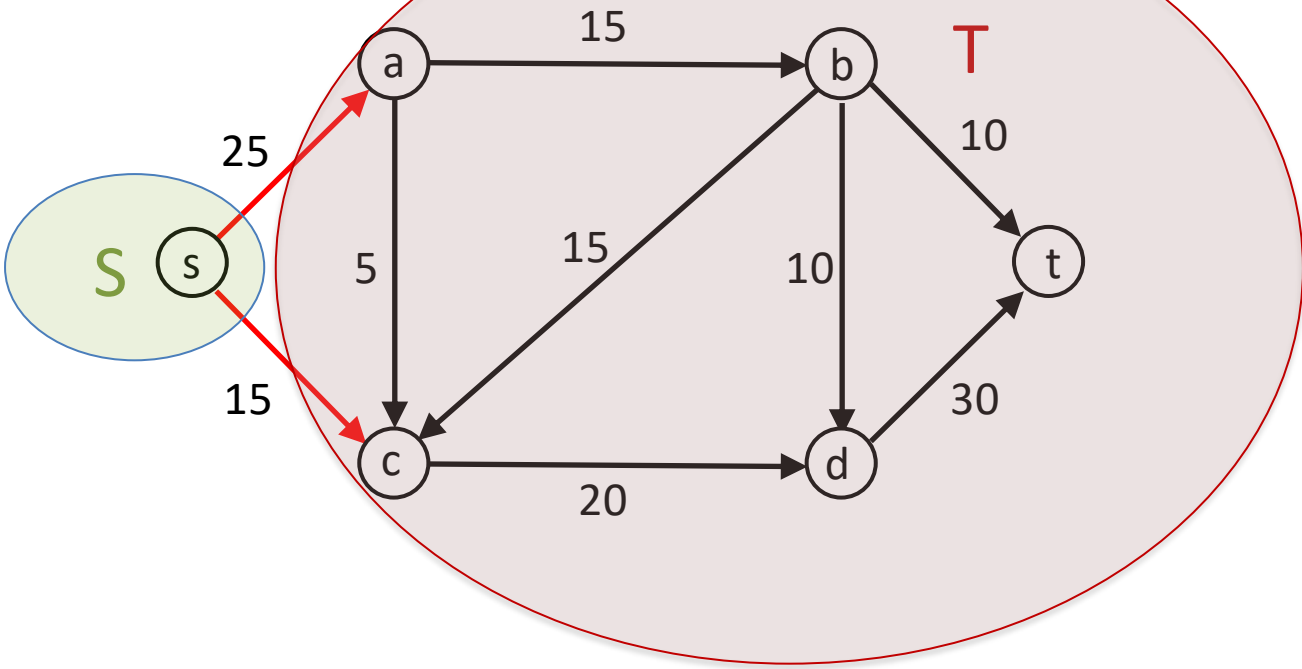


A flow network $\mathcal{F}$

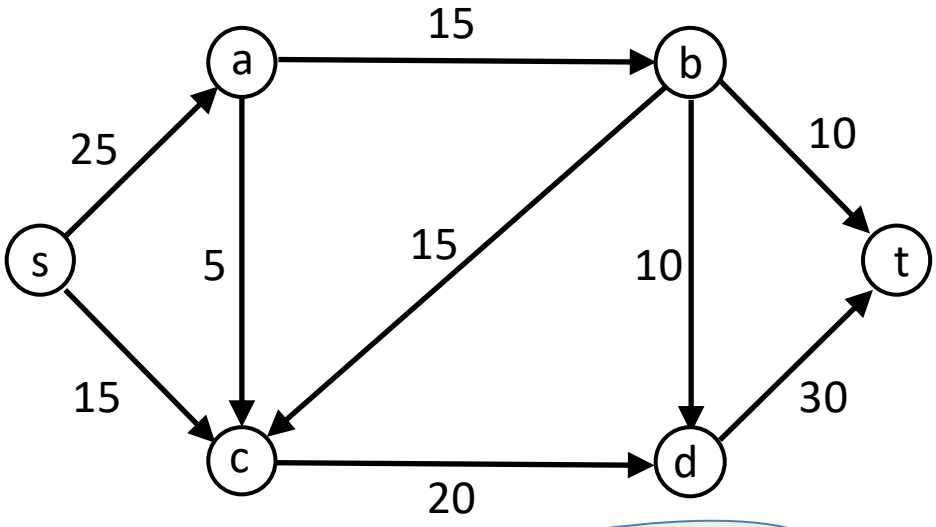


A cut (S, T)

$c(S, T) = 40$

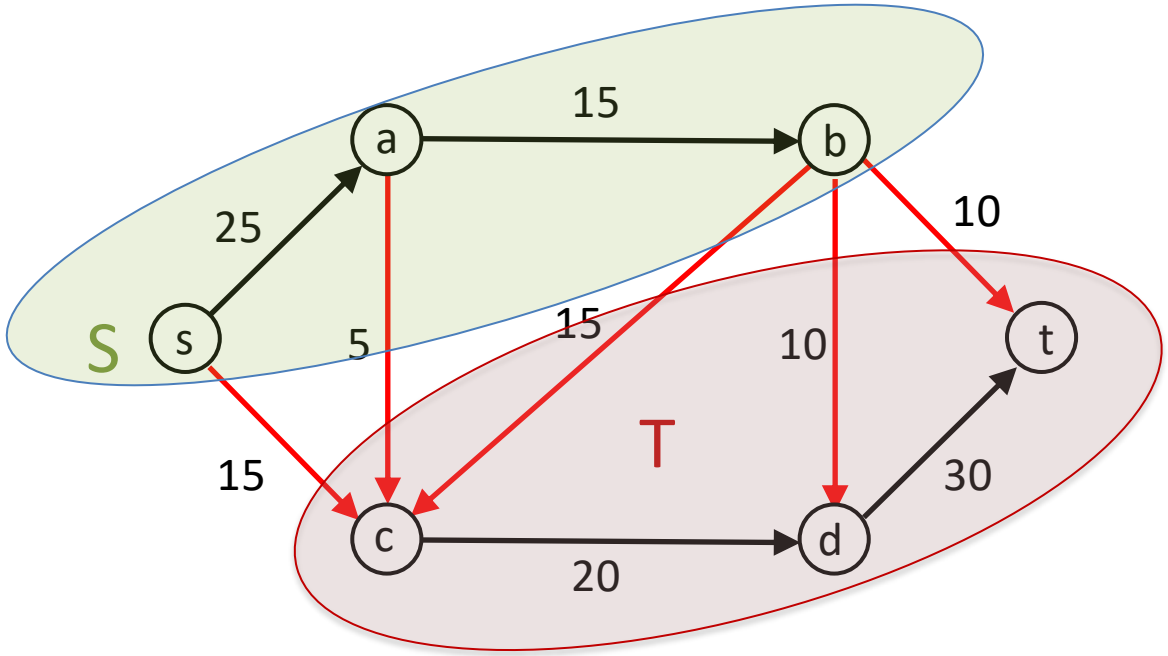


A flow network $\mathcal{F}$

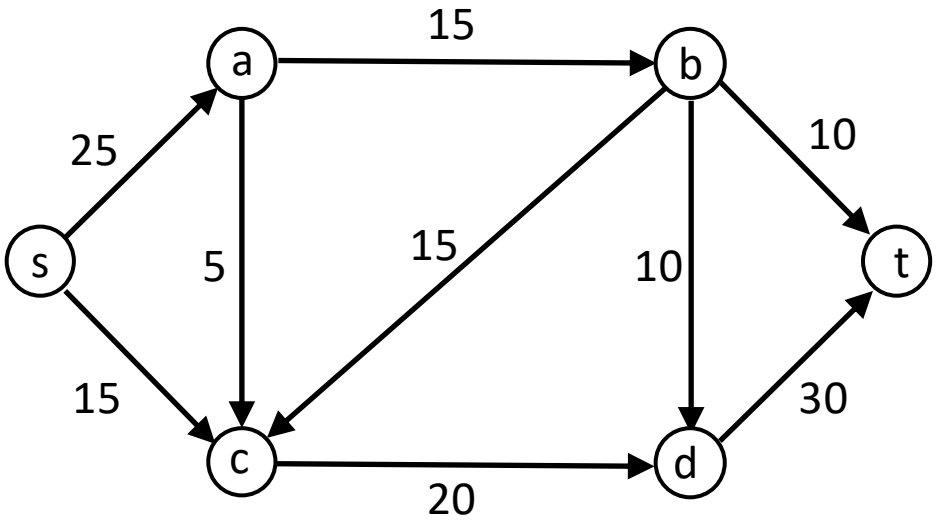


A cut (S, T)

$c(S, T) = 55$

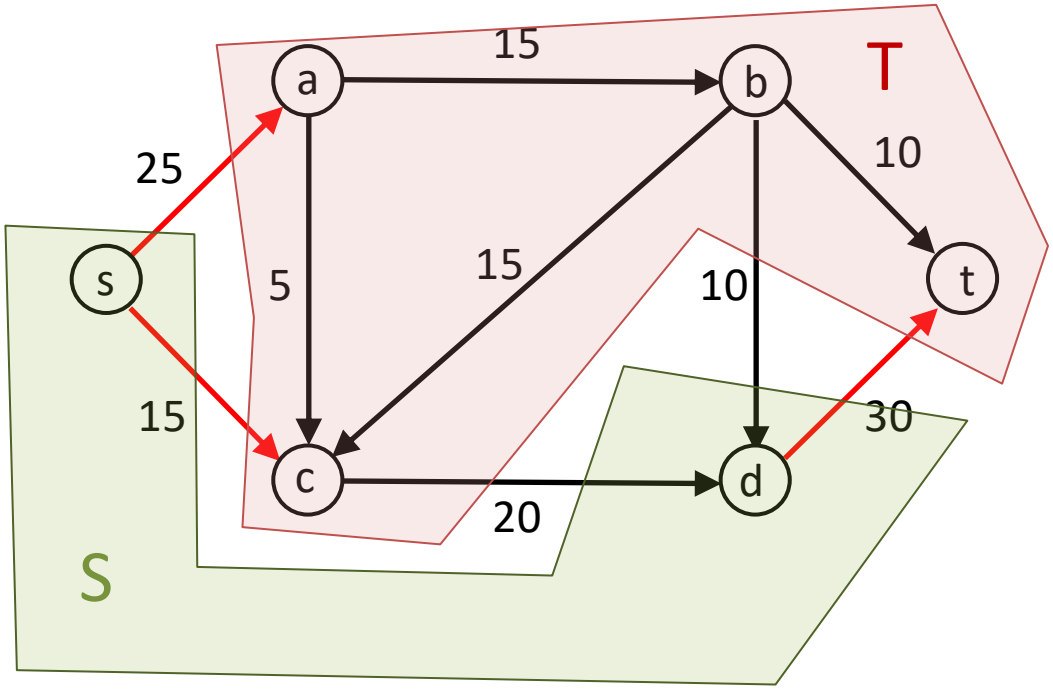


A flow network $\mathcal{F}$



A cut (S, T)

$c(S, T) = 70$



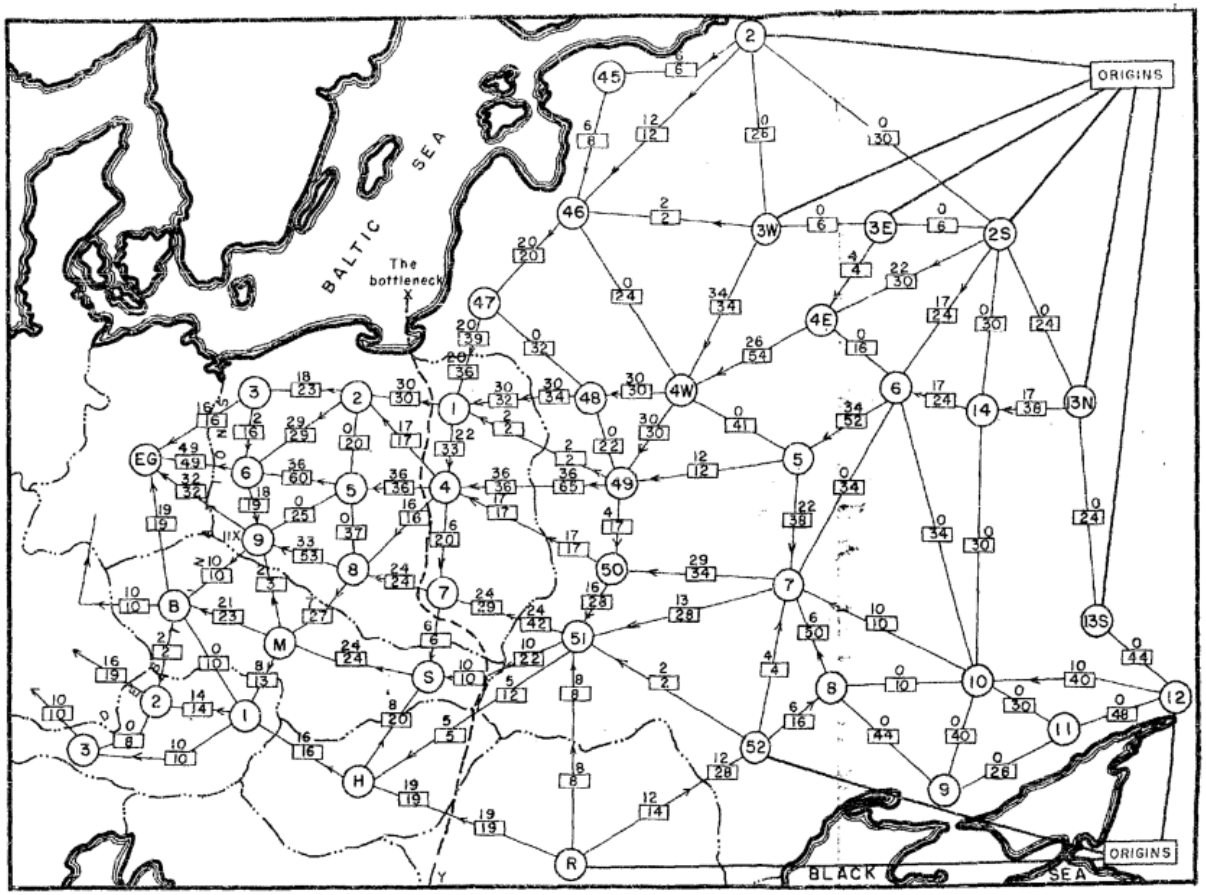


Fig. 7 — Traffic pattern: entire network available

Legend:

—·—·— International boundary

(B) Railway operating division

9 / 12 Capacity: 12 each way per day. Required flow of 9 per day toward destinations (in direction of arrow) with equivalent number of returning trains in opposite direction

All capacities in $\left.\begin{matrix}\text{trains}\\ \text{1000's of tons}\end{matrix}\right\}$ each way per day

Origins: Divisions 2, 3W, 3E, 2S, 13N, 13S, 12, 52 (USSR), and Roumania

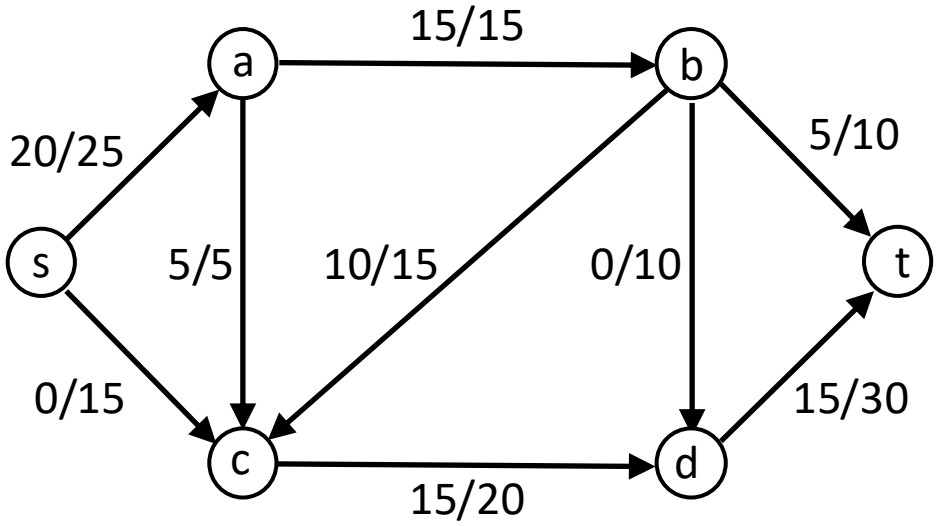
Destinations: Divisions 3, 6, 9 (Poland); B (Czechoslovakia); and 2, 3 (Austria)

Alternative destinations: Germany or East Germany

Note 11X at Division 9, Poland

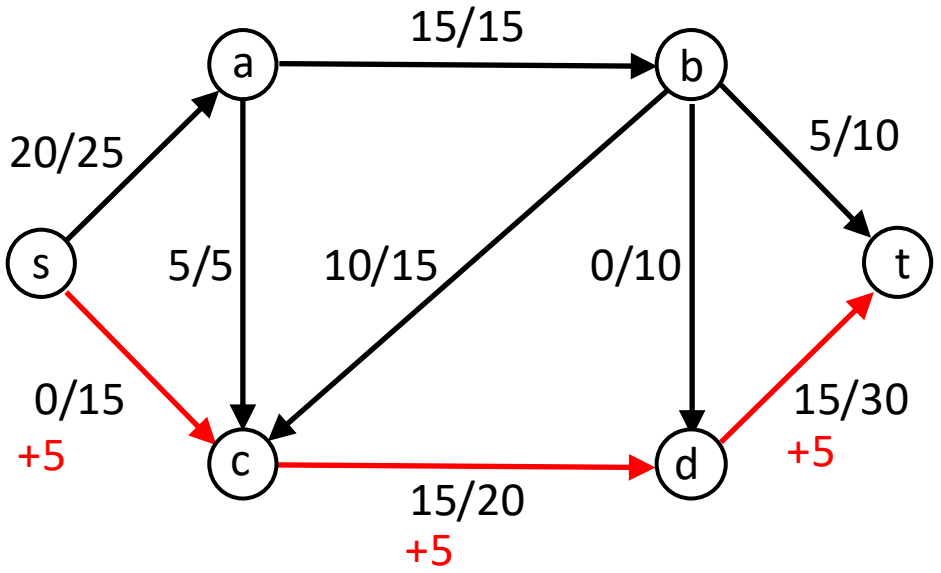
flow f

$\mathcal{V}(f) = 20$



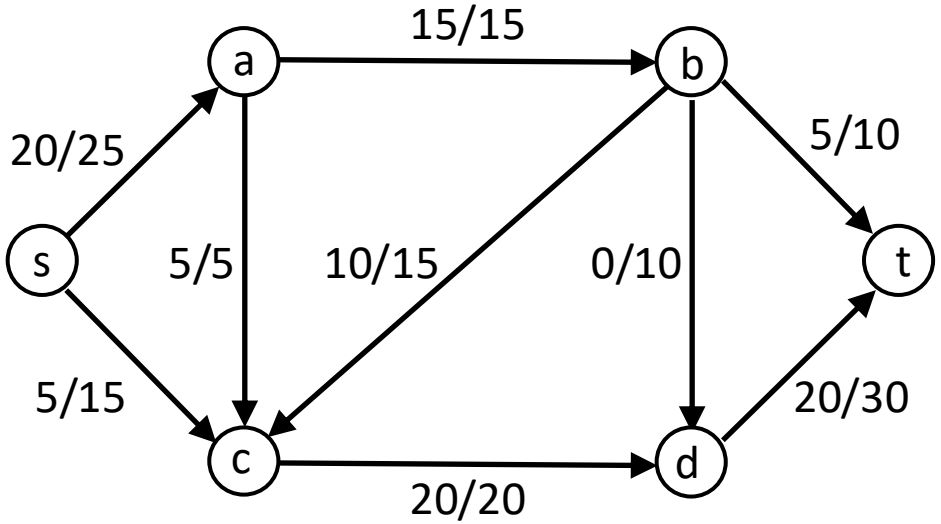
flow f

$\mathcal{V}(f) = 20$

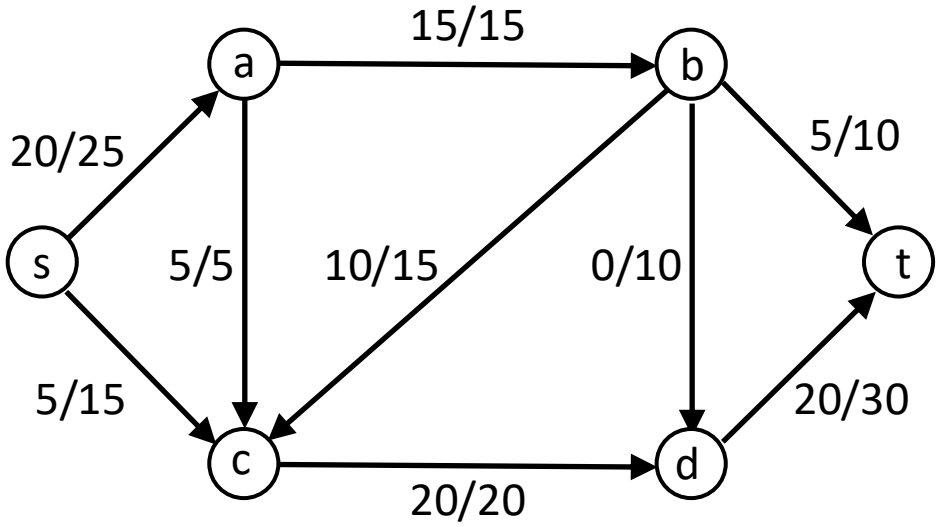


improved flow f'

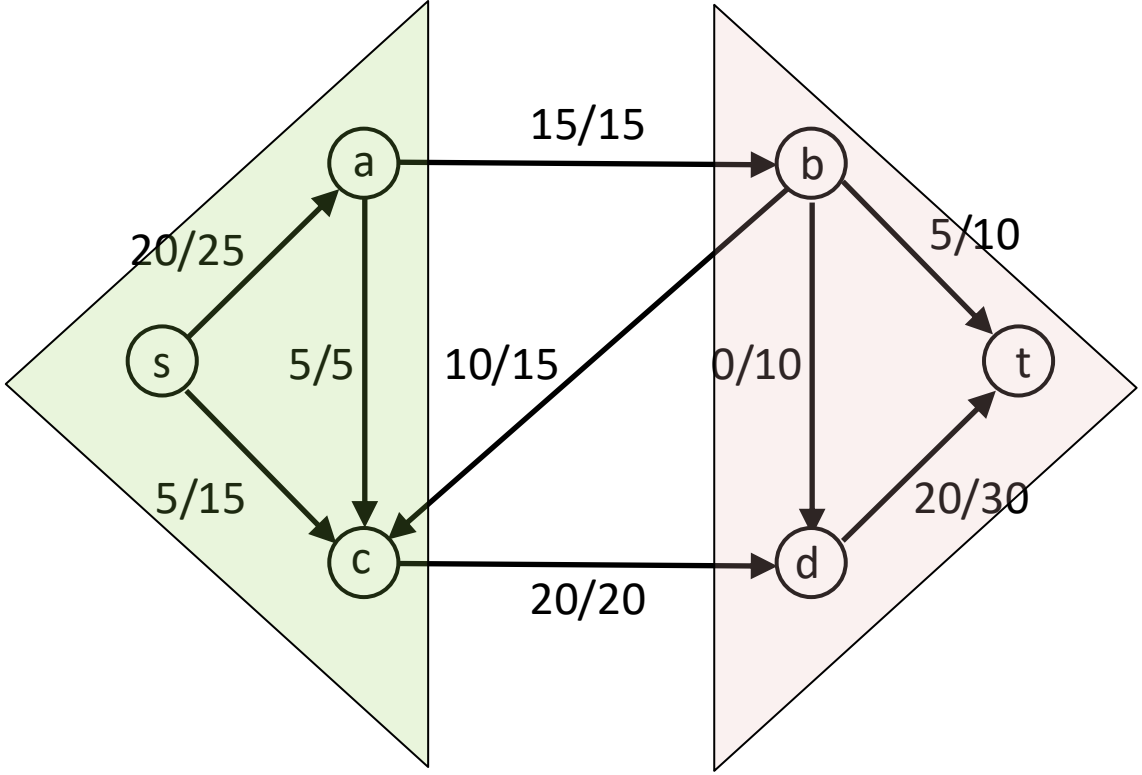
$\mathcal{V}(f') = ?$



flow f'
$\mathcal{V}(f') = 25$

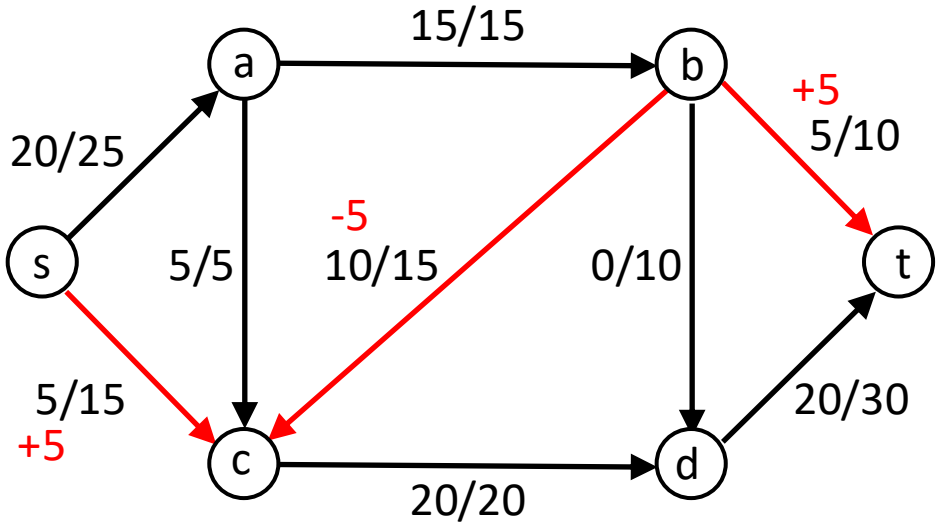


flow f'
$\mathcal{V}(f') = 25$



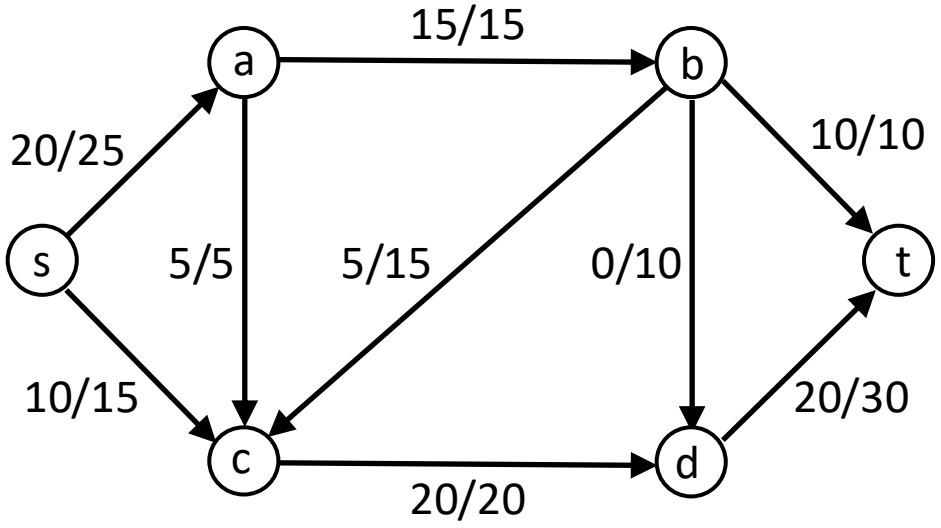
flow f'

$\mathcal{V}(f') = 25$

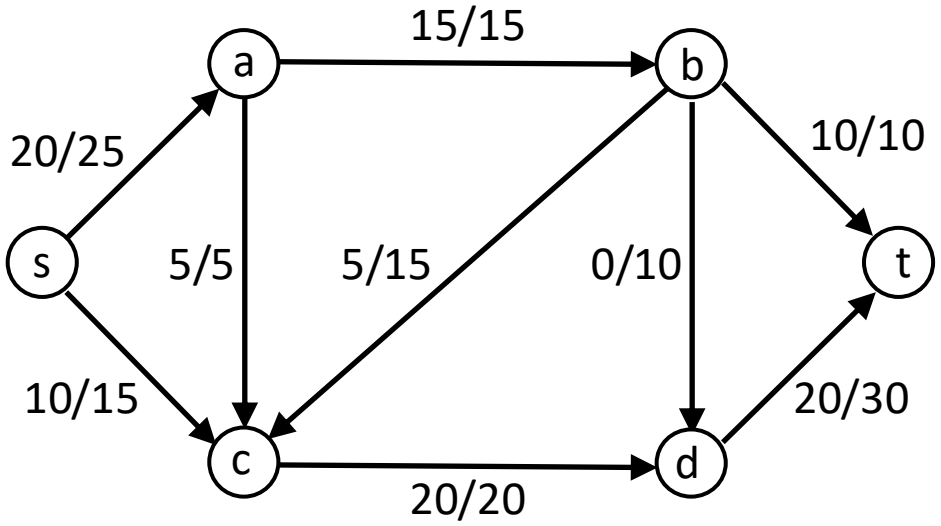


improved flow f''

$\mathcal{V}(f'') = ?$

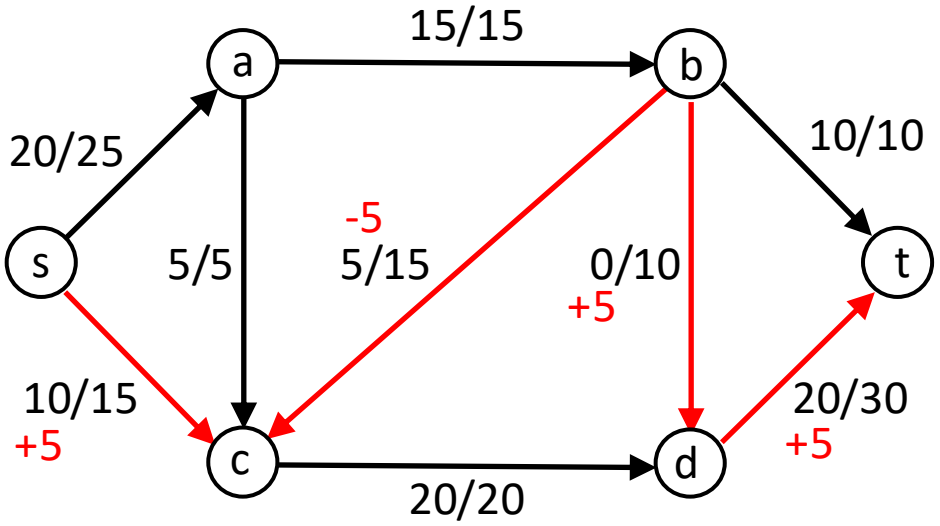


flow f''
$\mathcal{V}(f'') = 30$



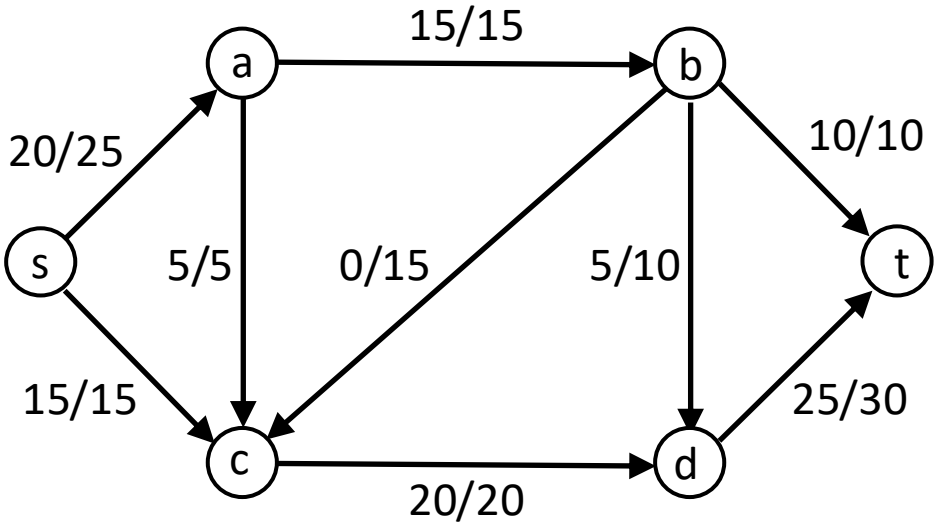
flow f''

$\mathcal{V}(f'') = 30$



flow f'''

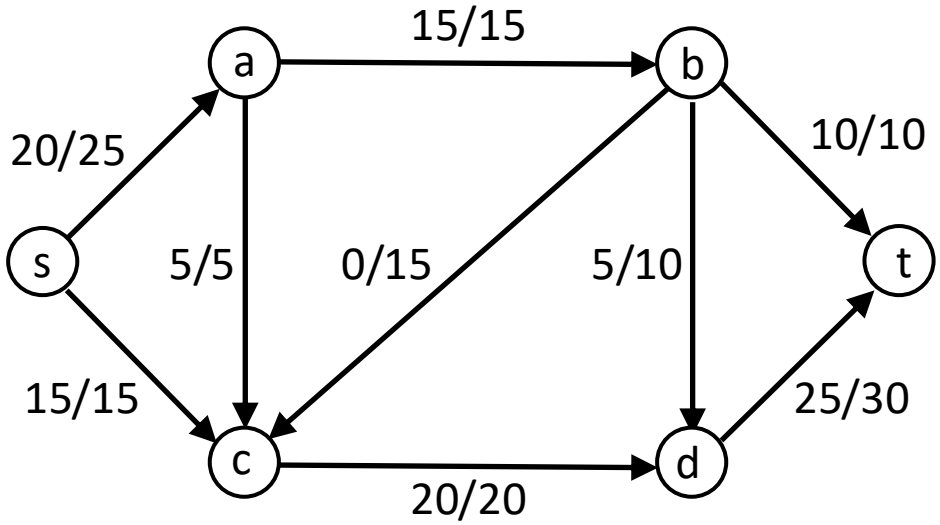
$\mathcal{V}(f''') = ?$



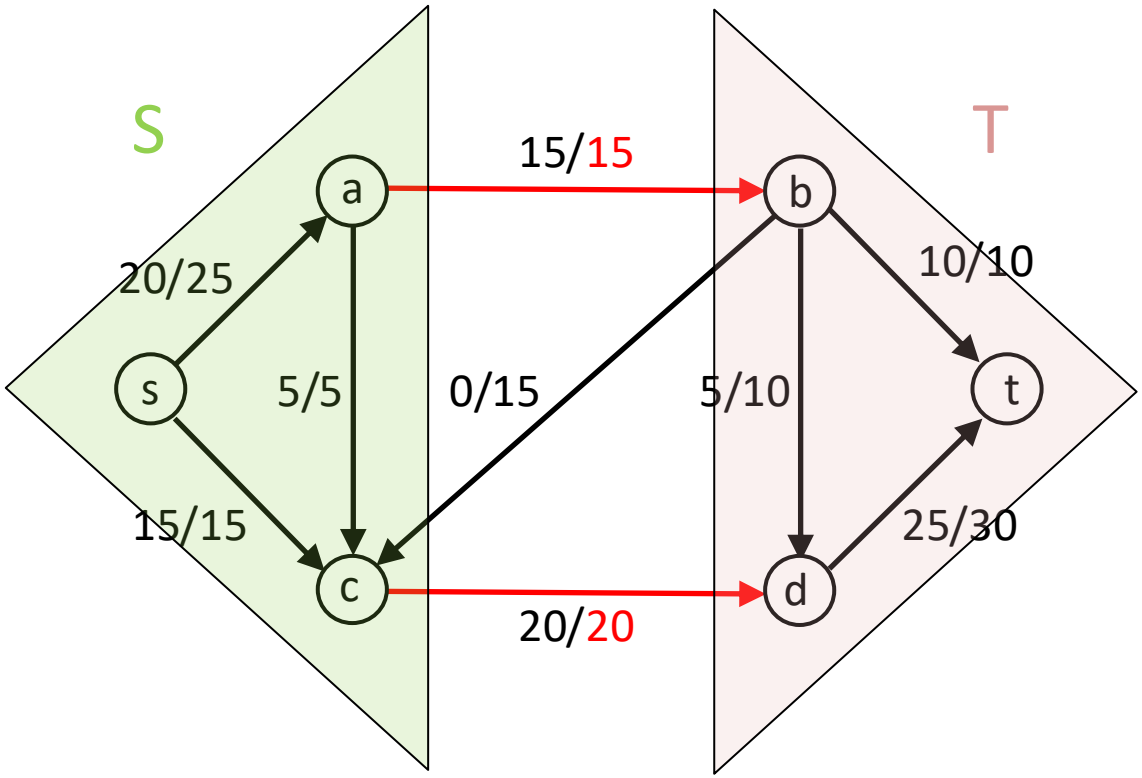
flow f'''

$\mathcal{V}(f''') = 35$

maximum!



flow f'''
$\mathcal{V}(f''') = 35$
maximum!



capacity of (S,T) cut = 35
no flow can have value that exceeds this
$\Longrightarrow f'''$ is maximum flow

instance of general important property:
(value of) max flow = (capacity of) min cut