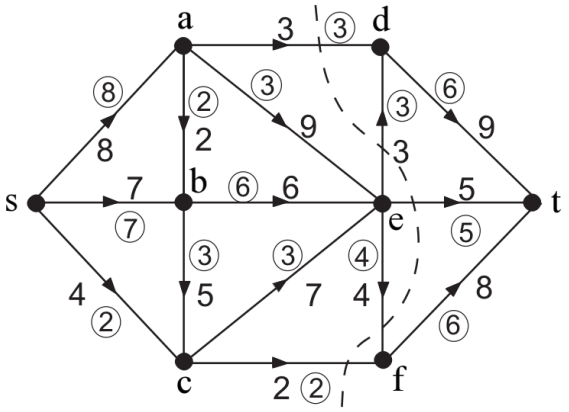
3. Network flows

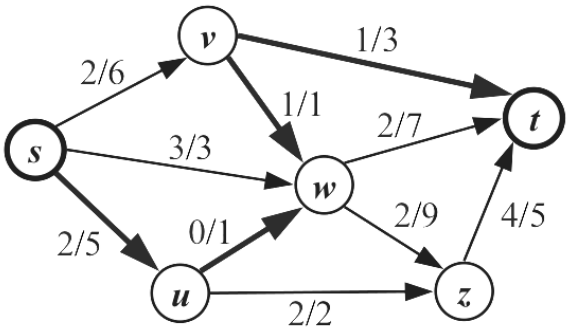
1. Consider the network in the figure (s is the source, t is the sink; the capacity of an edge is the number on the edge which is NOT in a circle).

a) Check that the numbers in cycles determine a feasible flow.
b) Determine the capacity of the $[S,T]$-cut for $S = \{s, a, b, c, e\}$ and $T = \{d, f, t\}$.
c) Determine the value of the given flow.
d) Is this flow value maximal? Justify your answer.

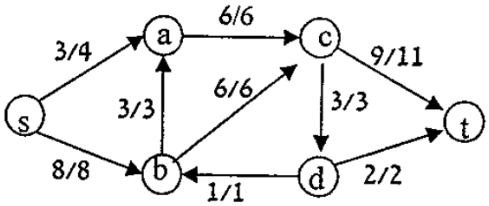


2. Consider the network in the figure.

a) Check that the first numbers on edges determine a feasible flow.
b) Check that the path $suwvt$ is an augmenting path, and using that, find a feasible flow with greater flow value.
c) Find a maximum flow in the network, and prove its maximality.



3. Consider the network in the figure.



a) Determine the value of the given flow.
b) Find an augmenting path, and augment the flow along it.
c) Is the obtained flow is a maximum flow? (Justify your answer.)