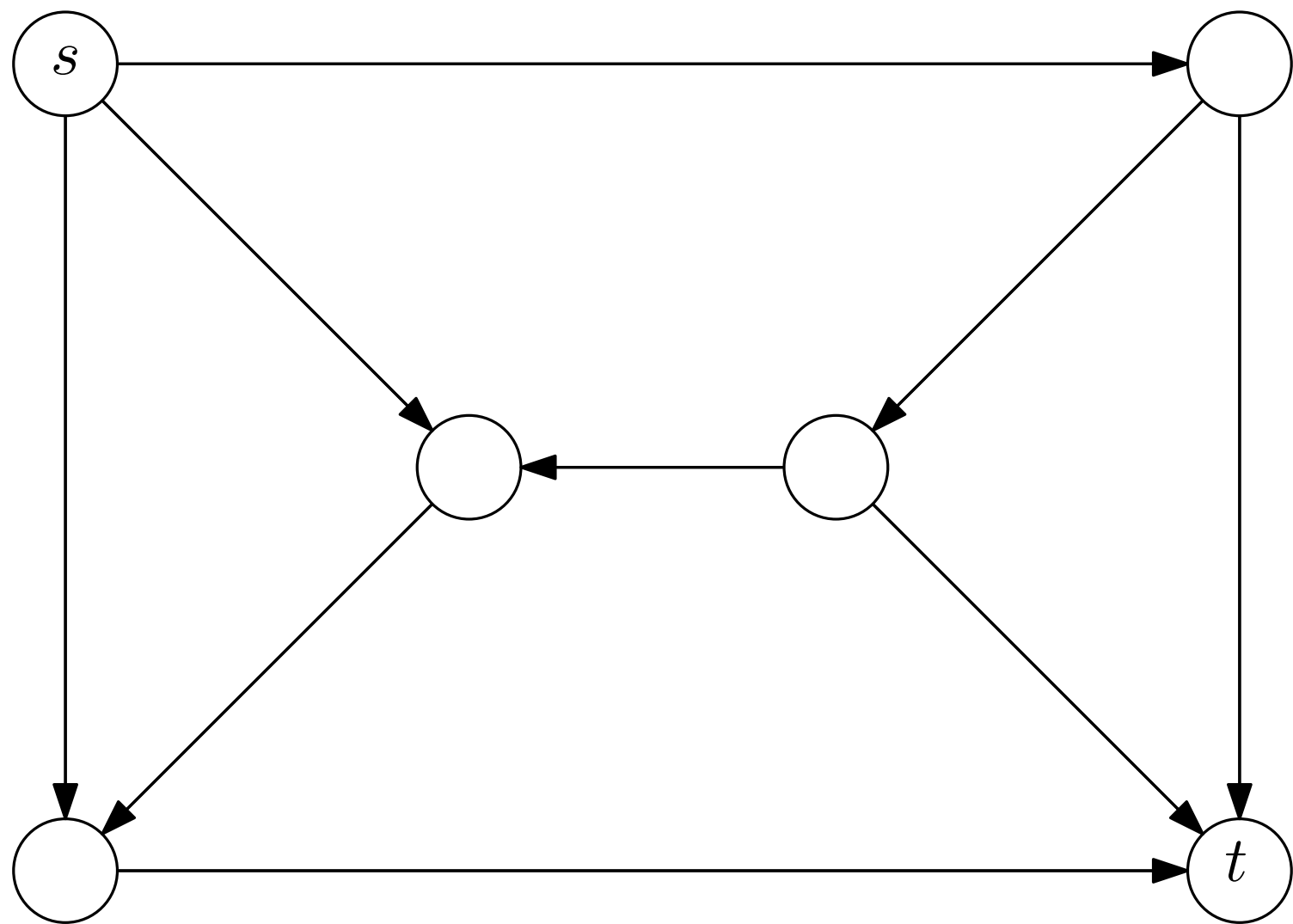
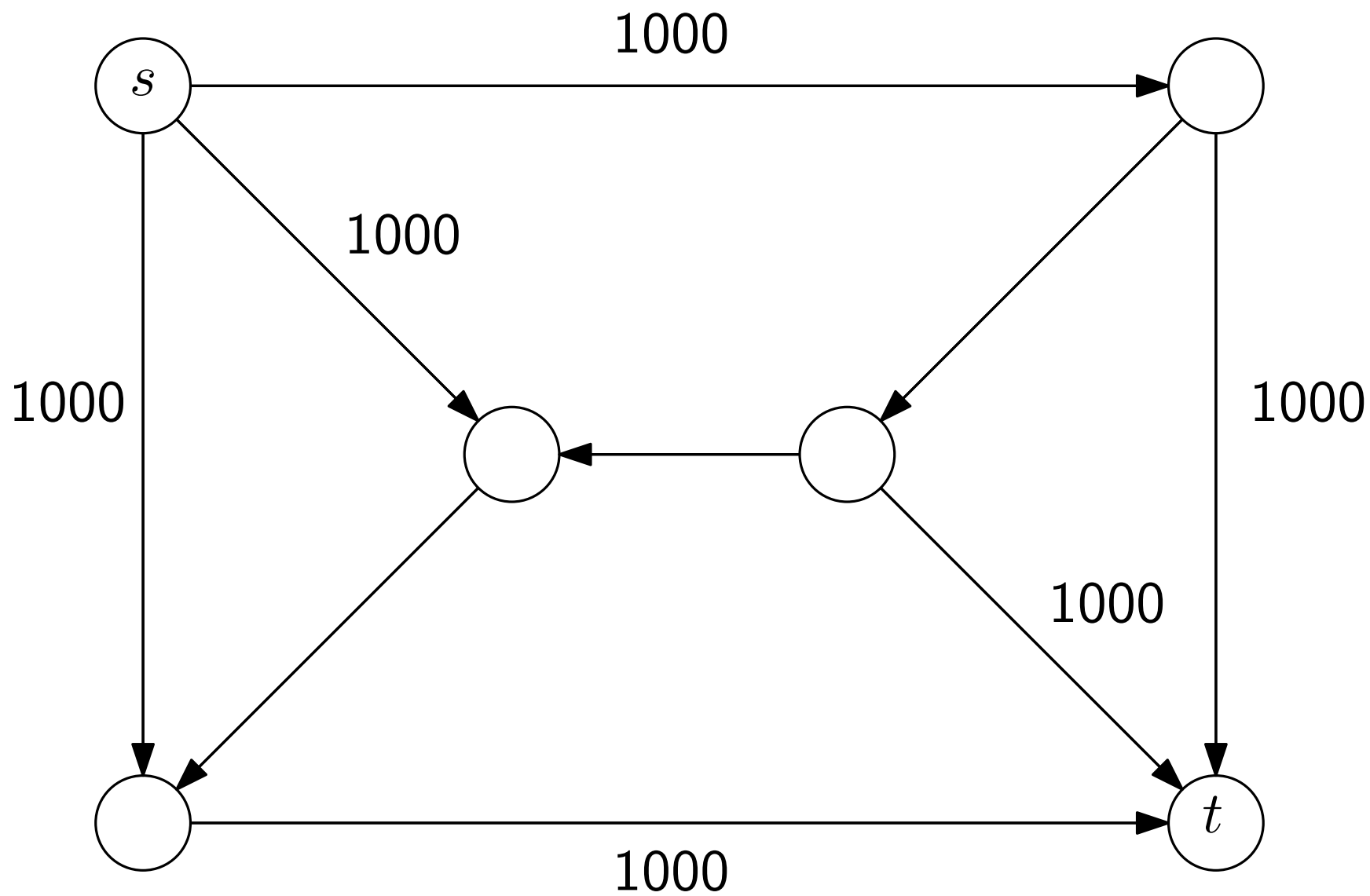


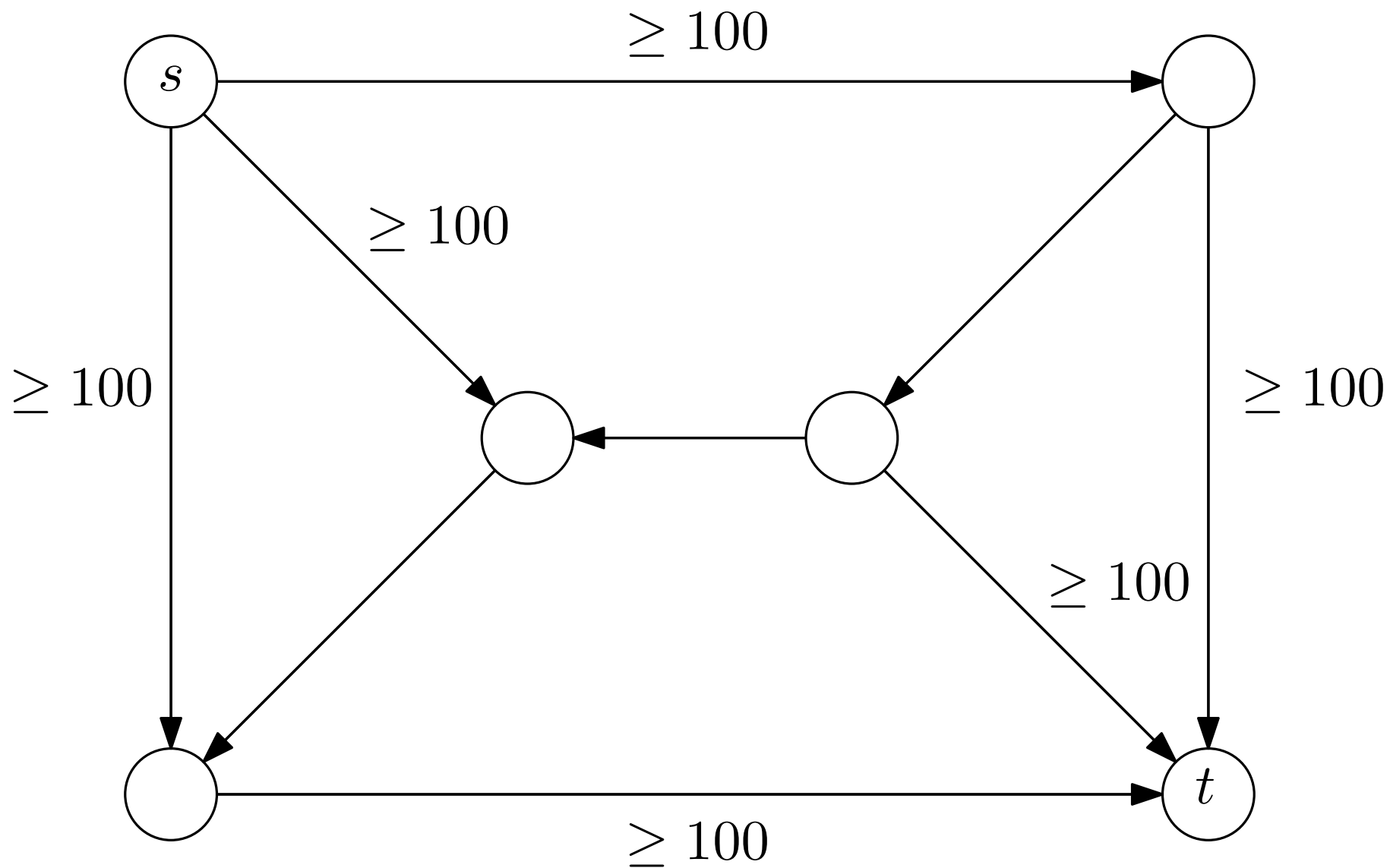
A Pathological Example for Ford-Fulkerson

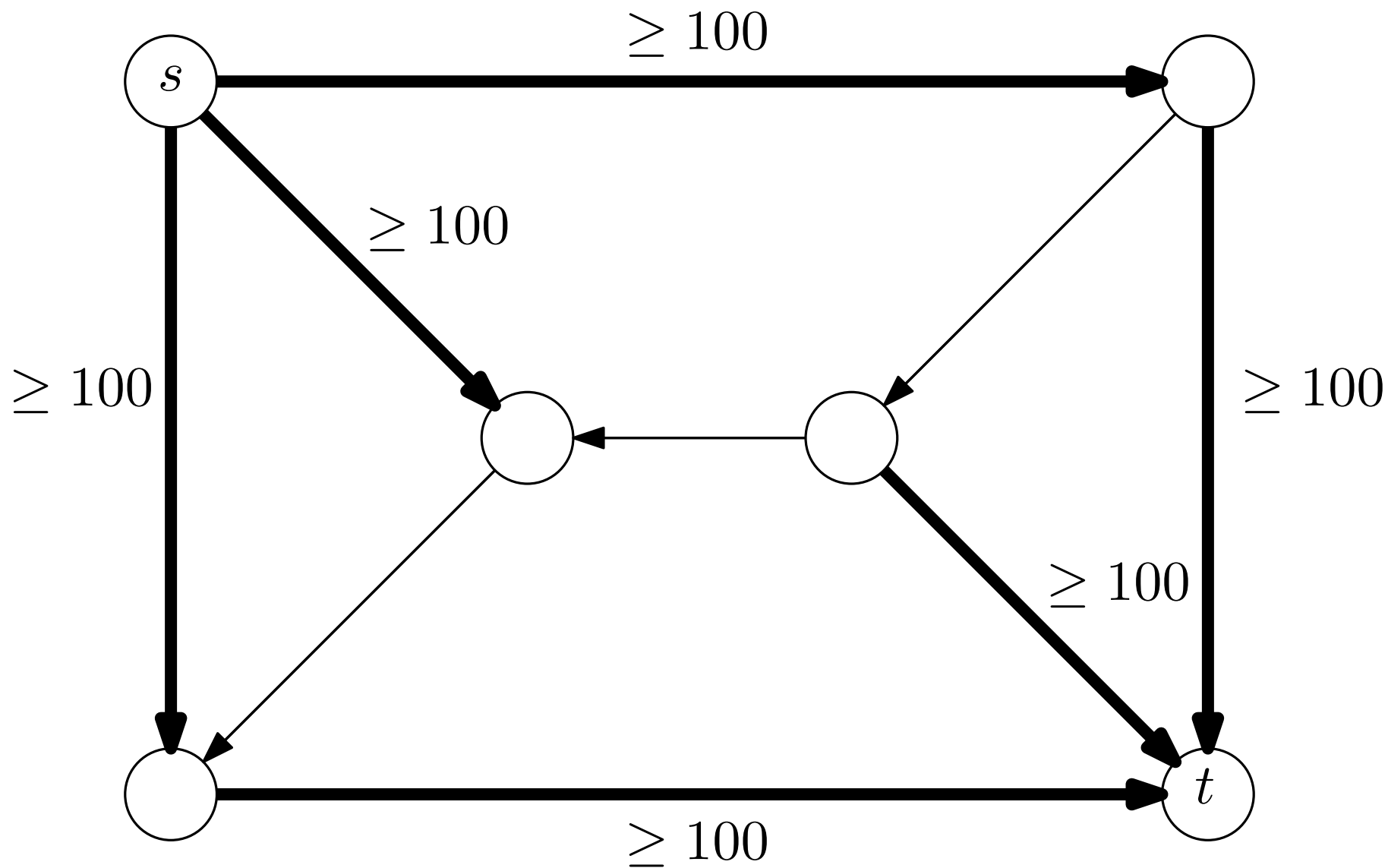
Example taken from

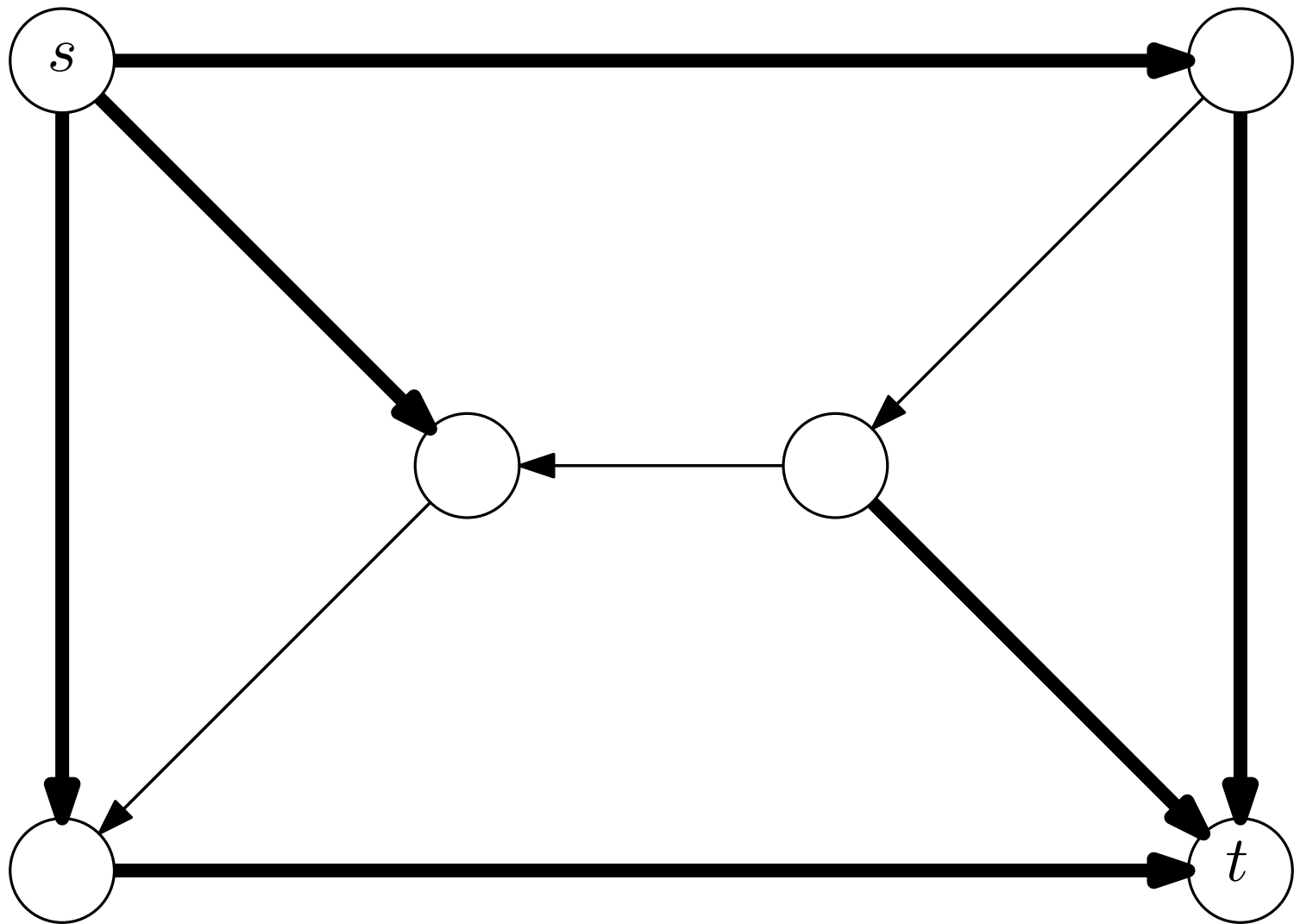
<https://cs.fit.edu/~wds/classes/aa/KT/07DemoFordFulkersonPathological.pdf>

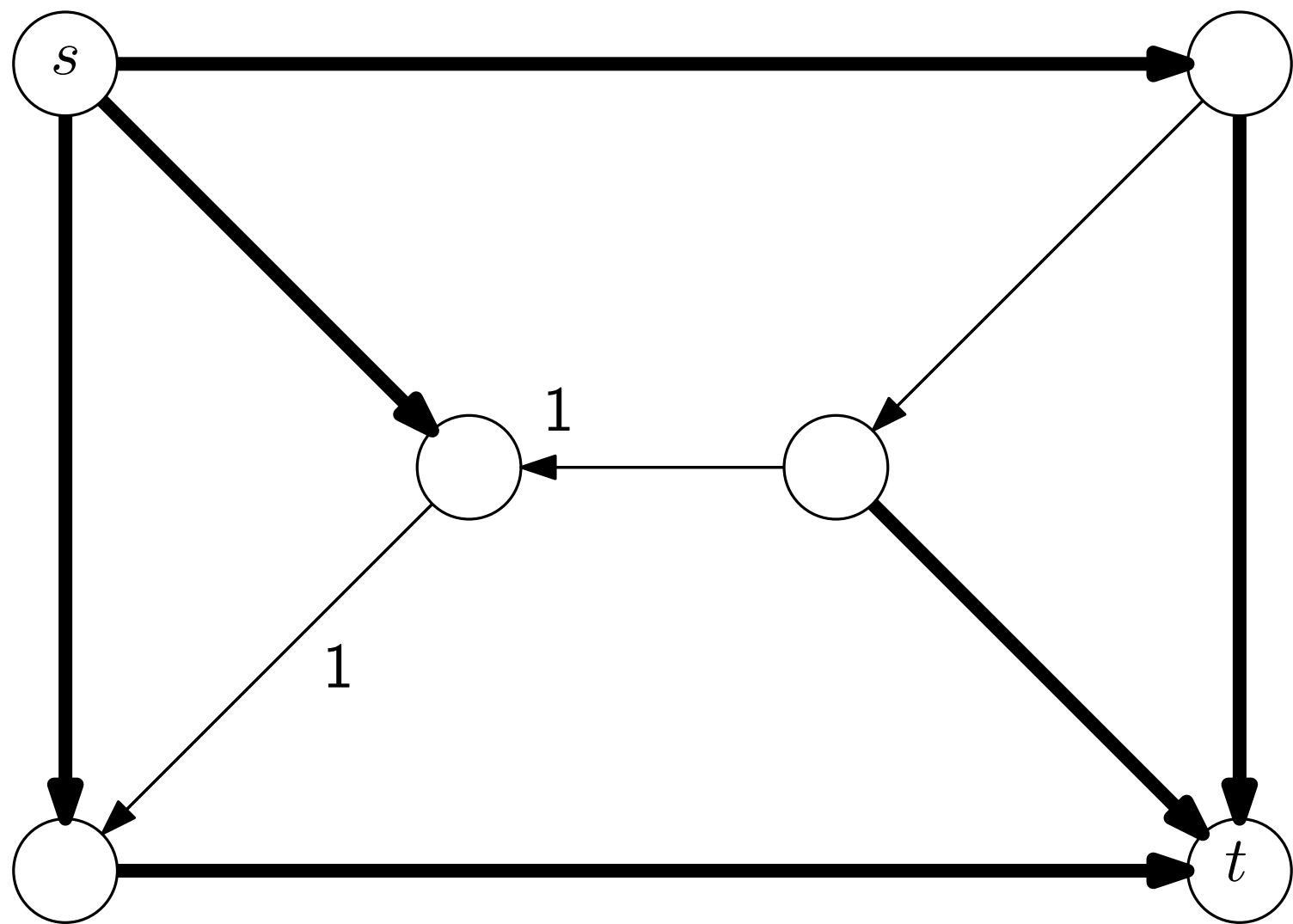


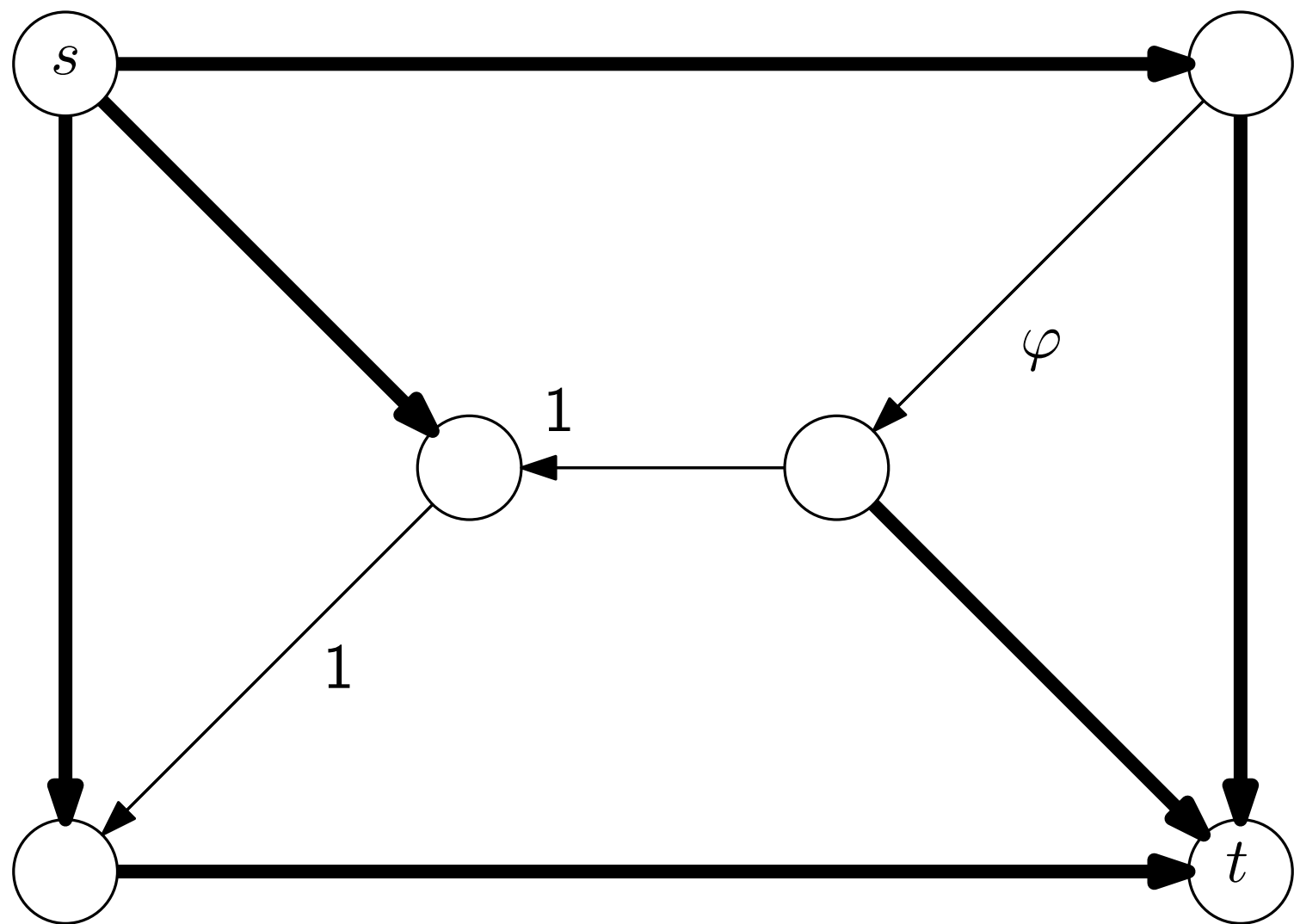


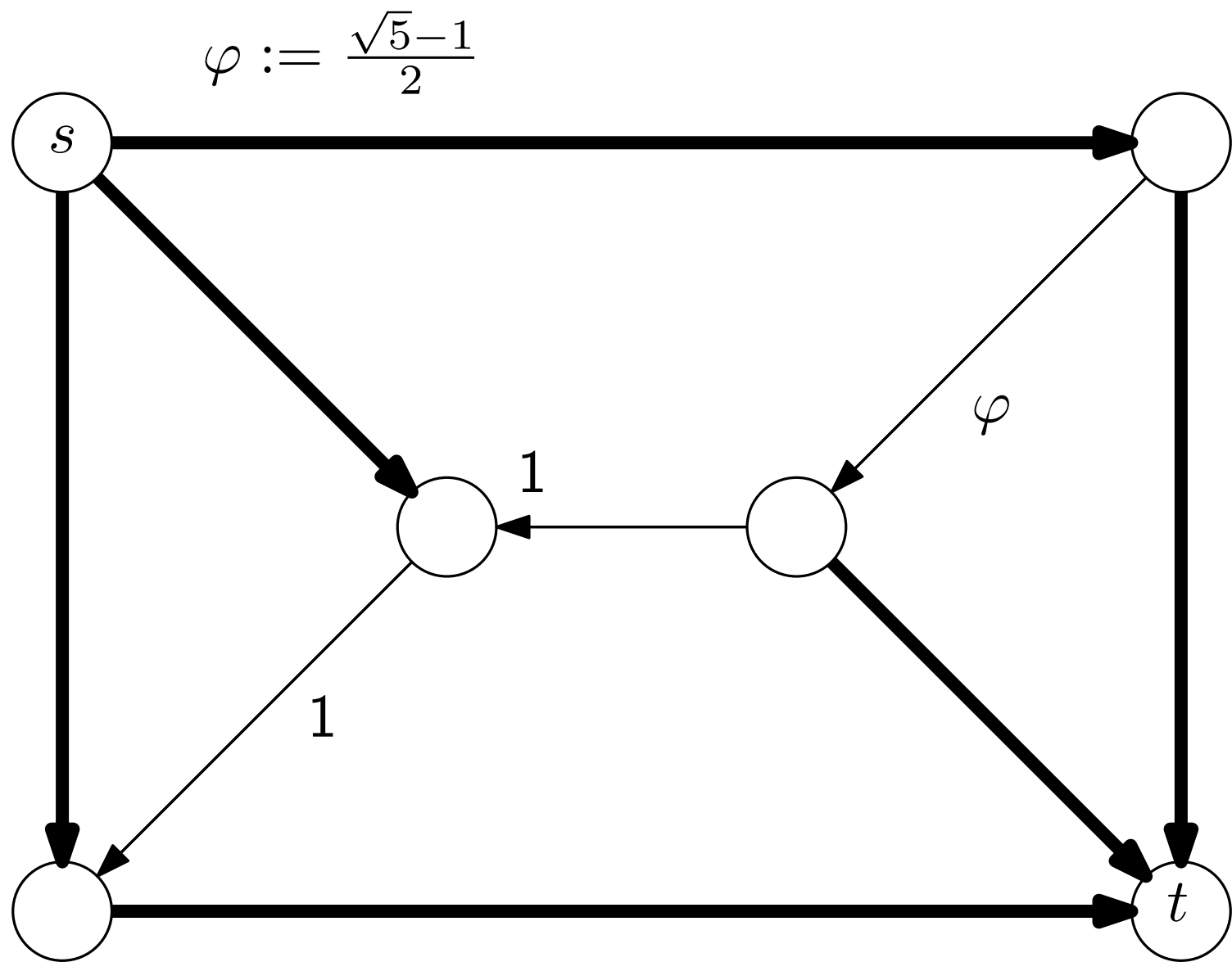


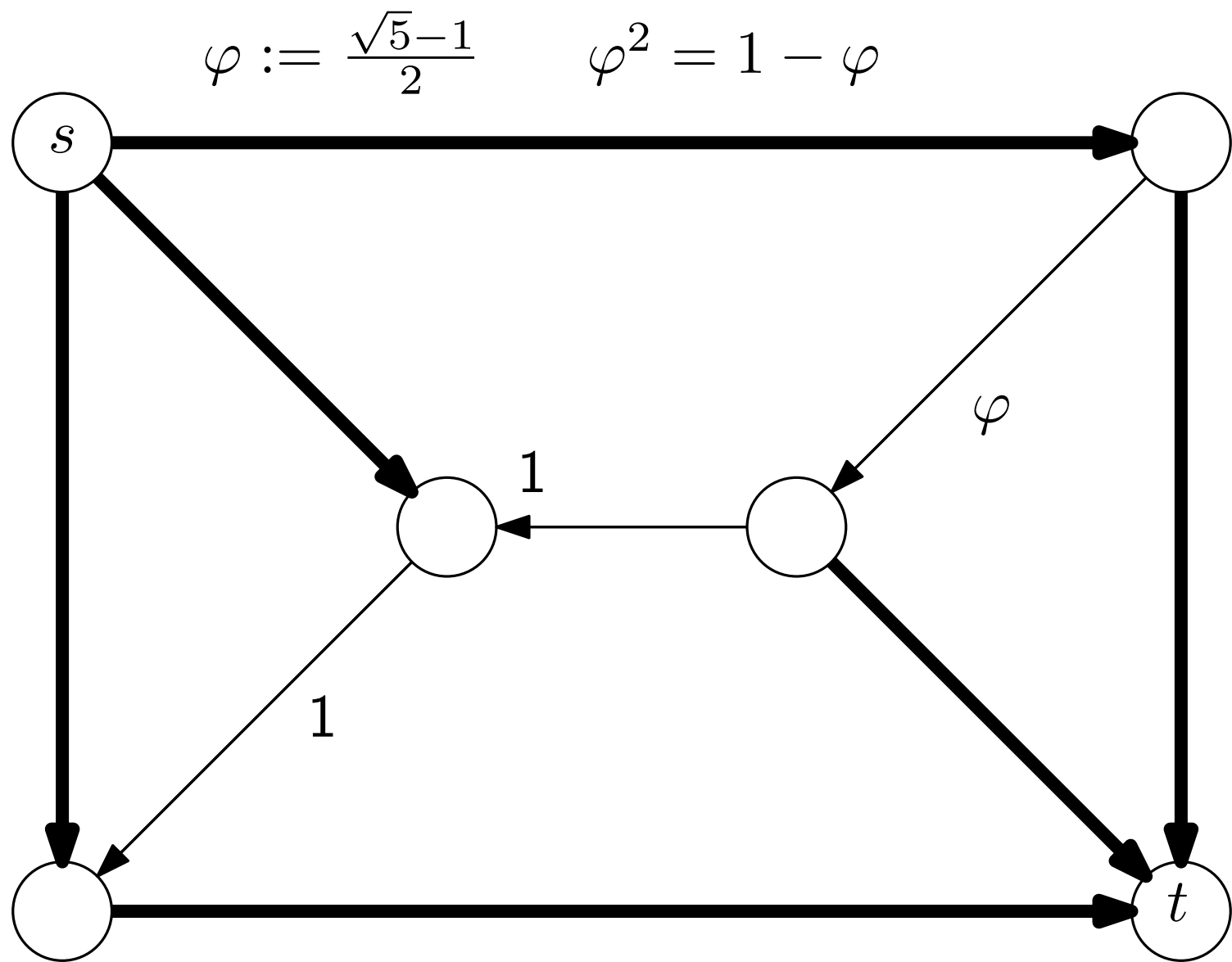


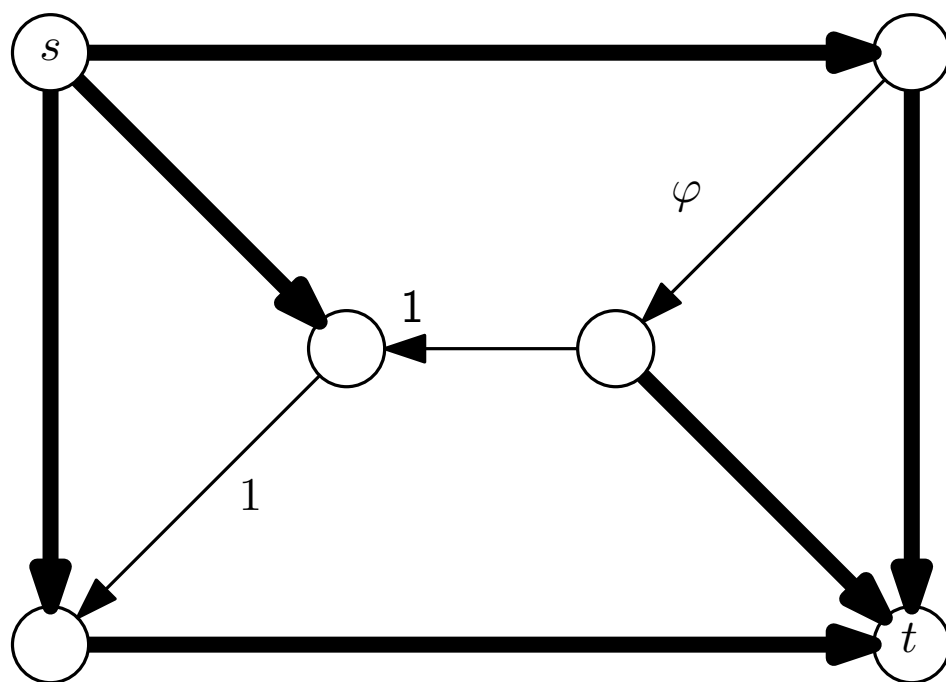






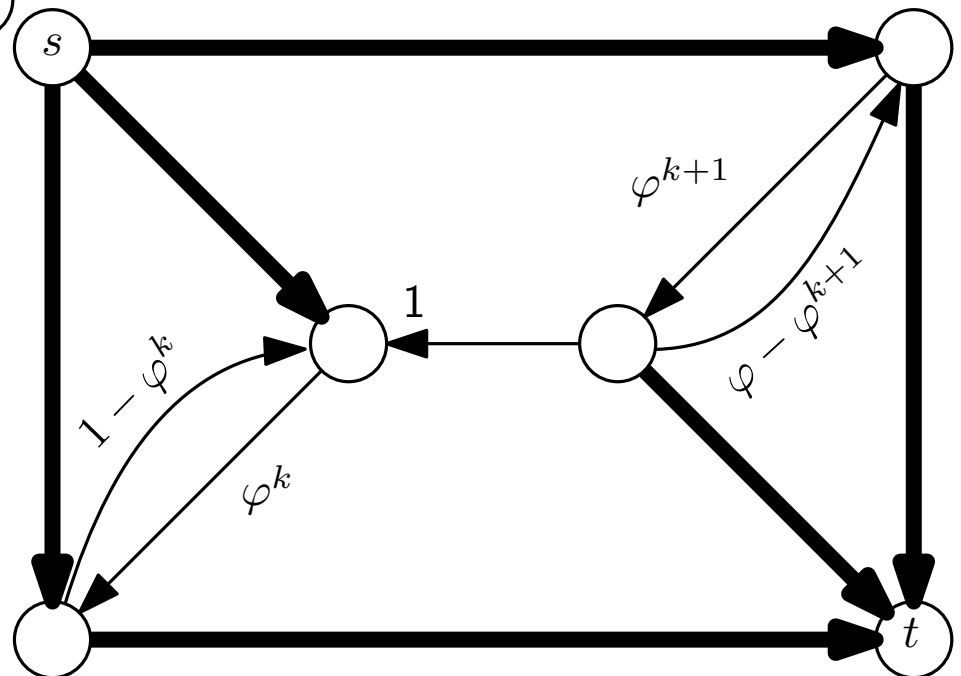
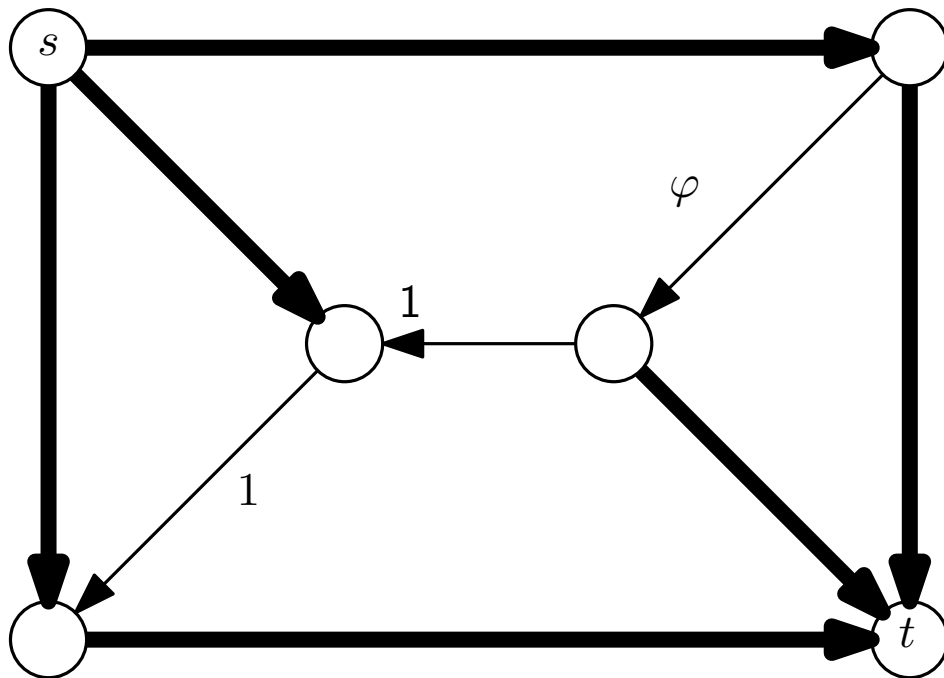


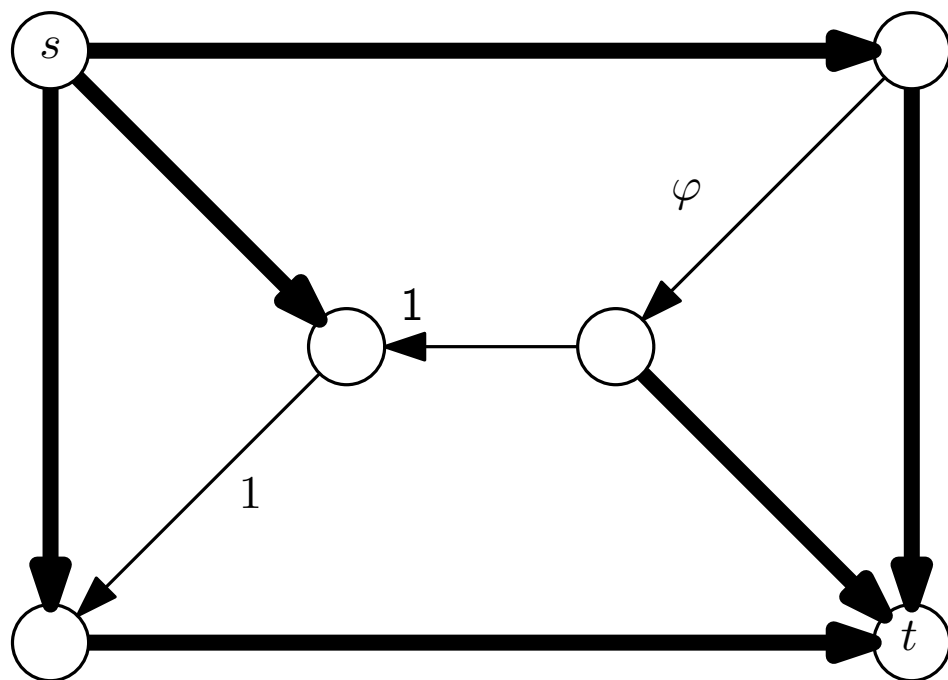




more generally:

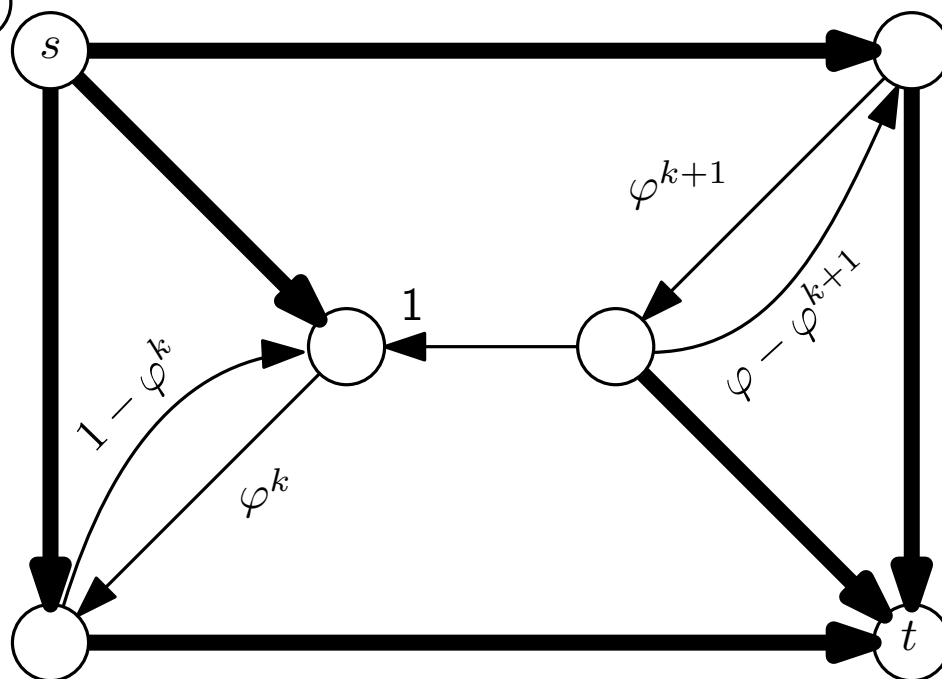
more generally:



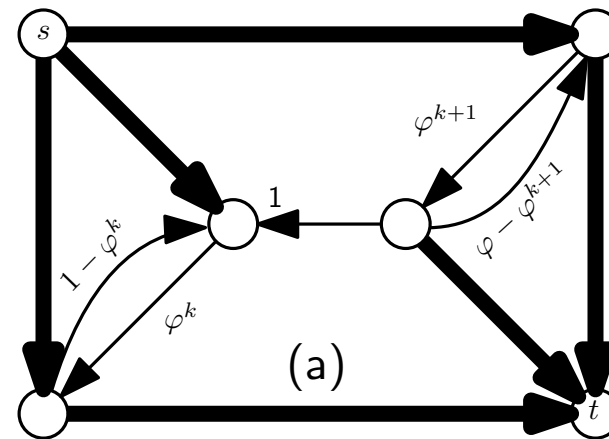


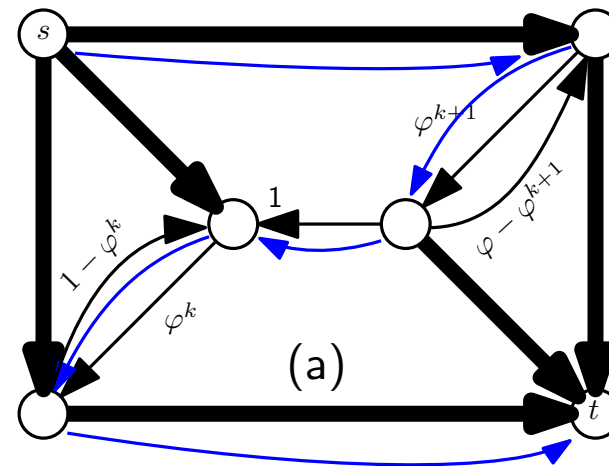
more generally:

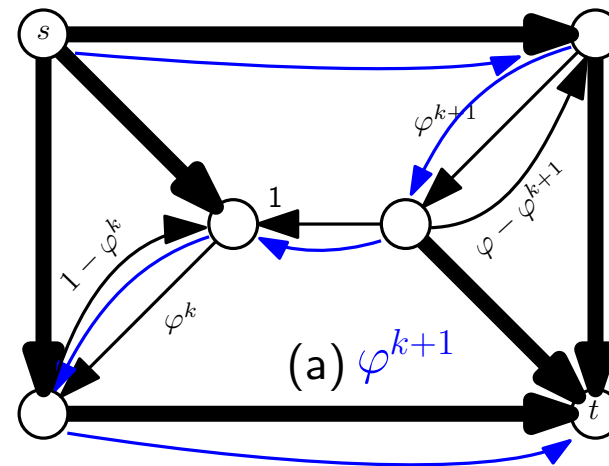
for $k = 0$, this
is the same

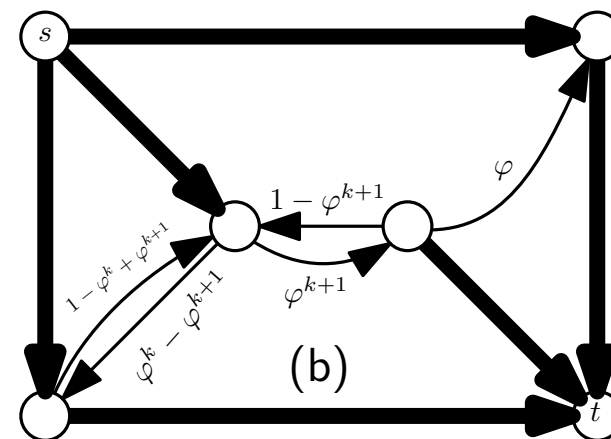
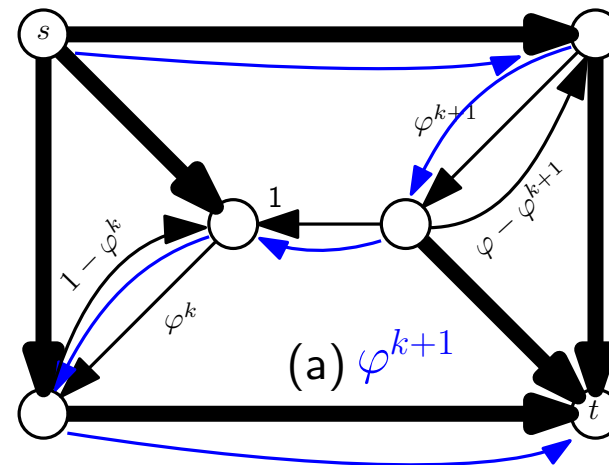


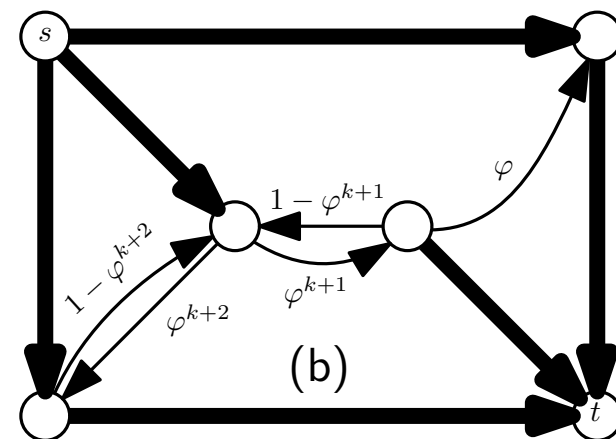
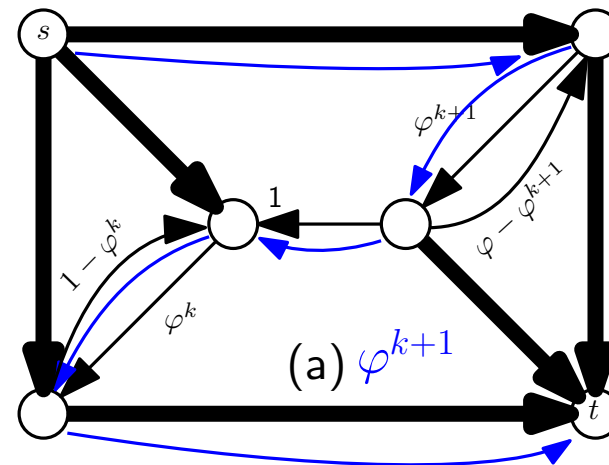
Let's run Ford-Fulkerson

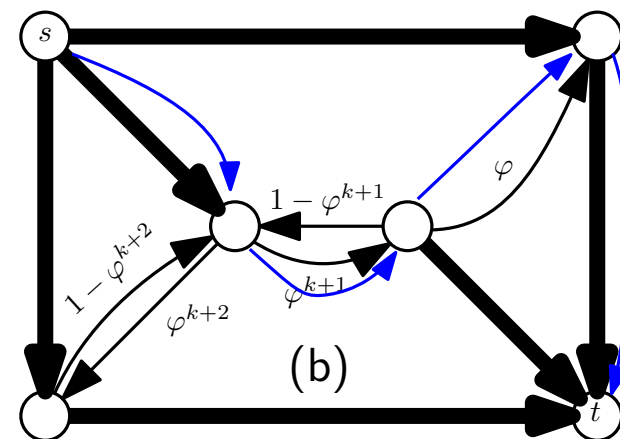
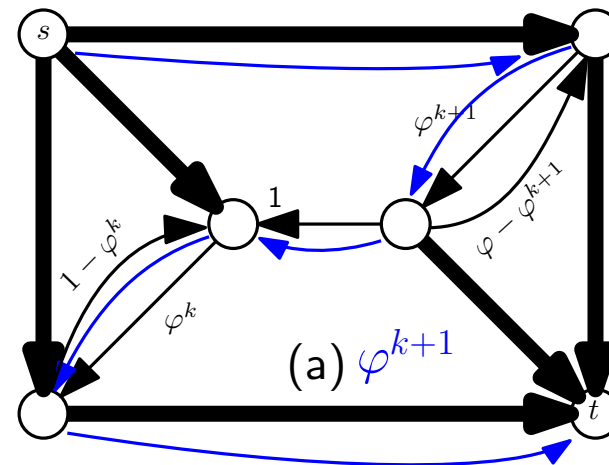


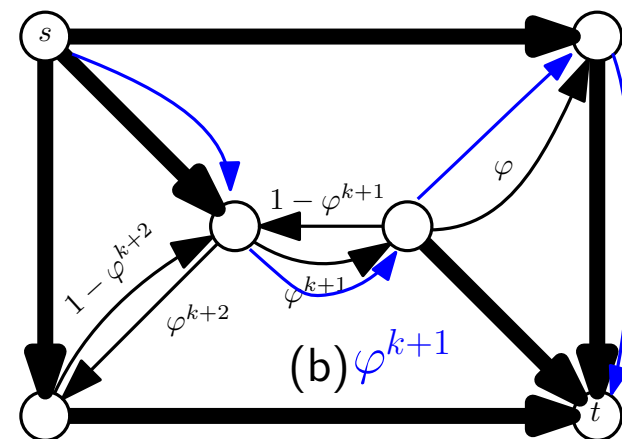
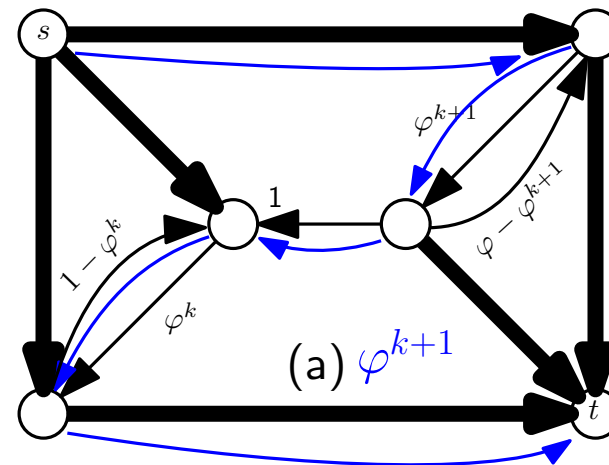


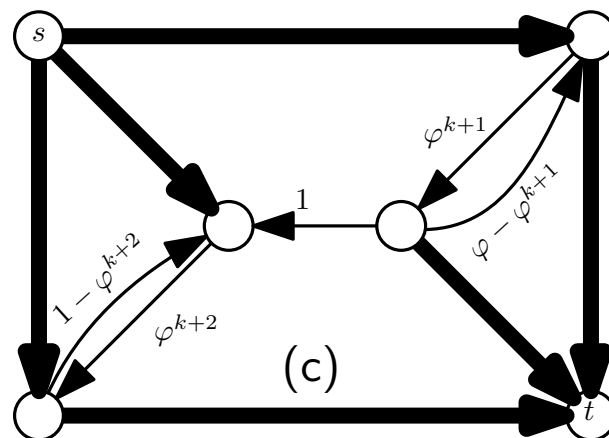
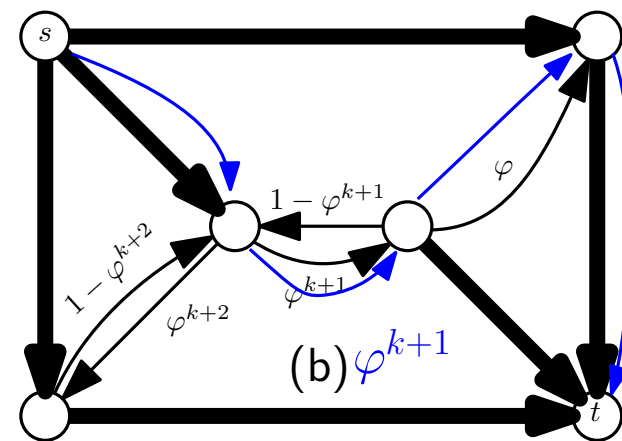
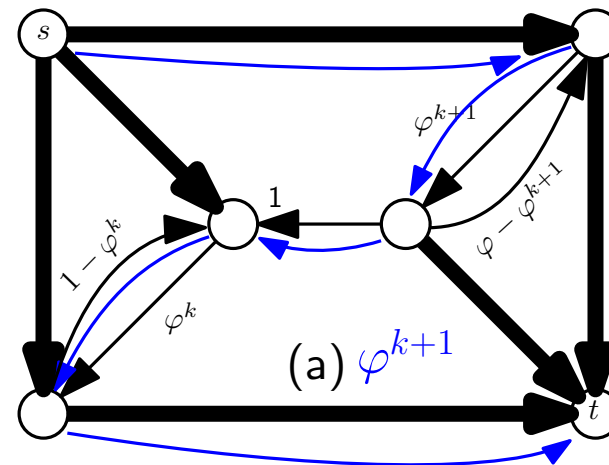


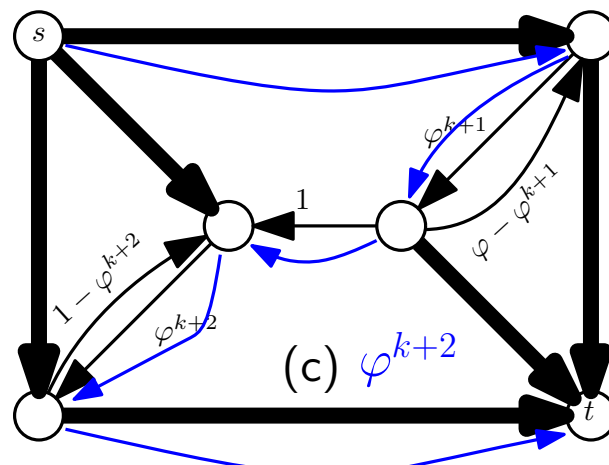
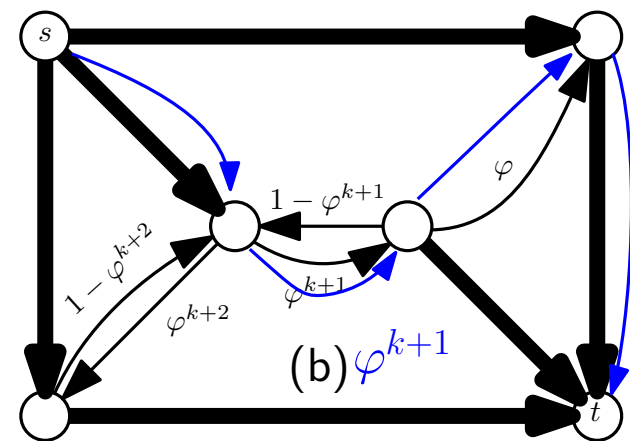
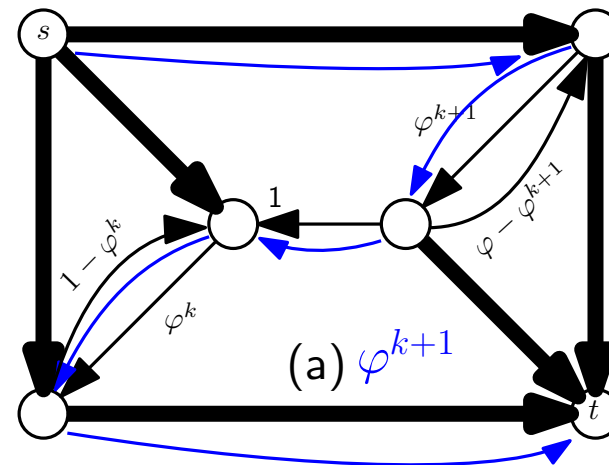


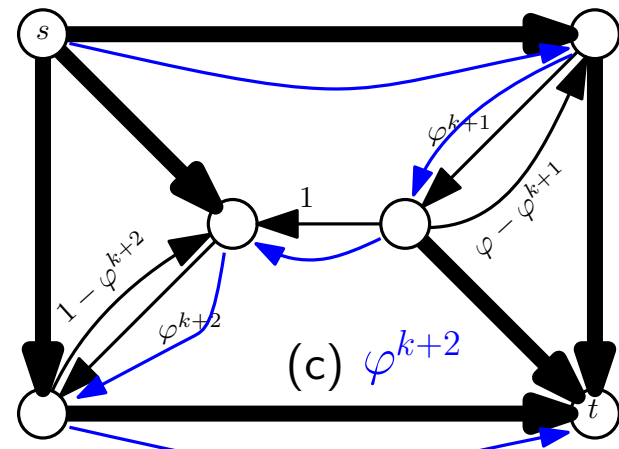
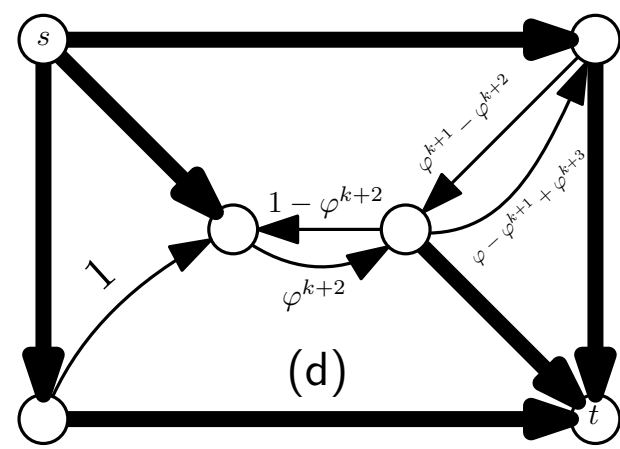
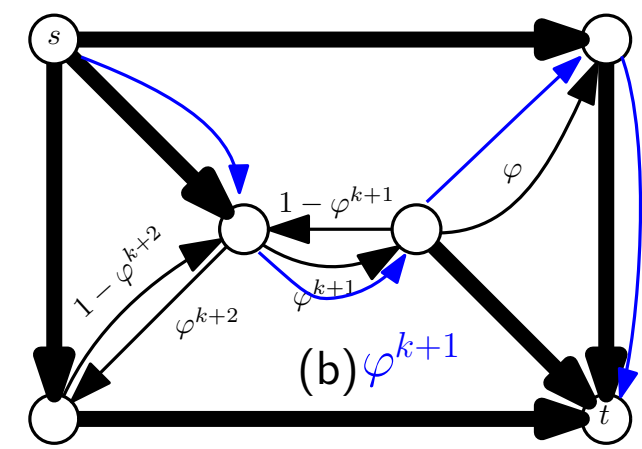
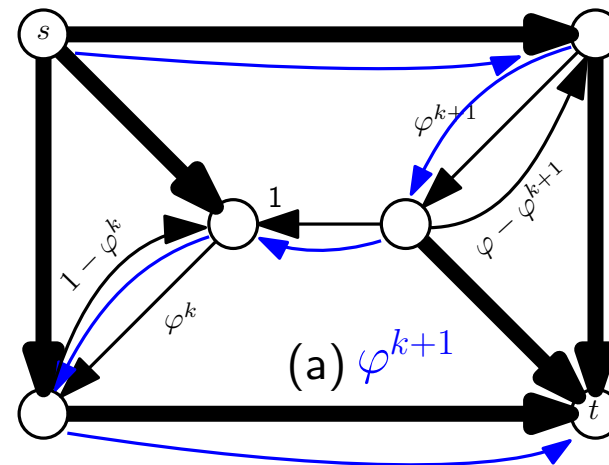


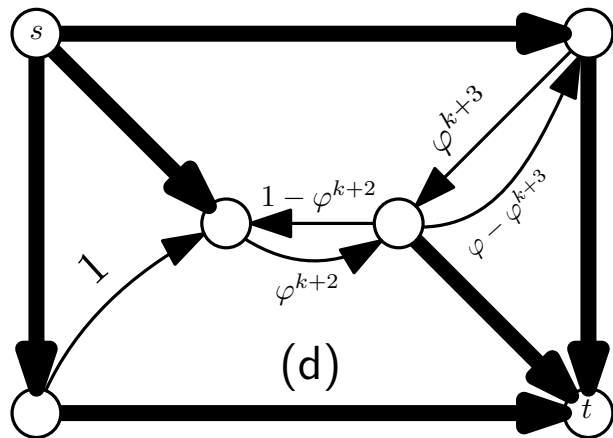
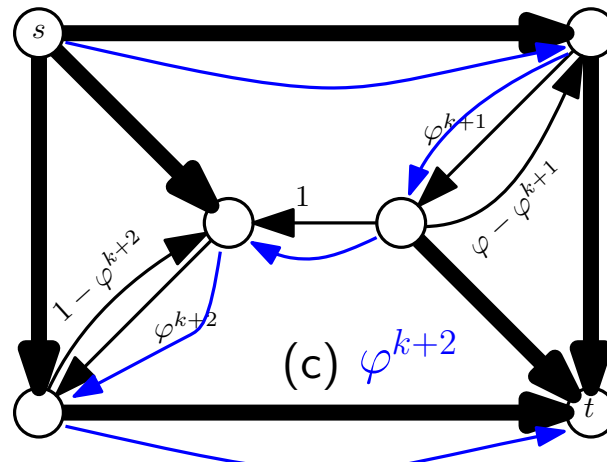
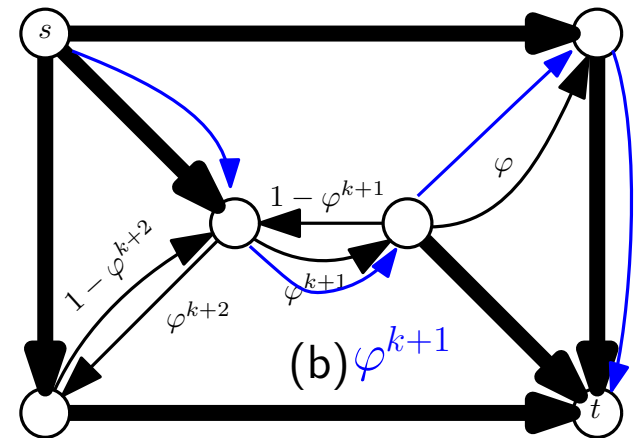
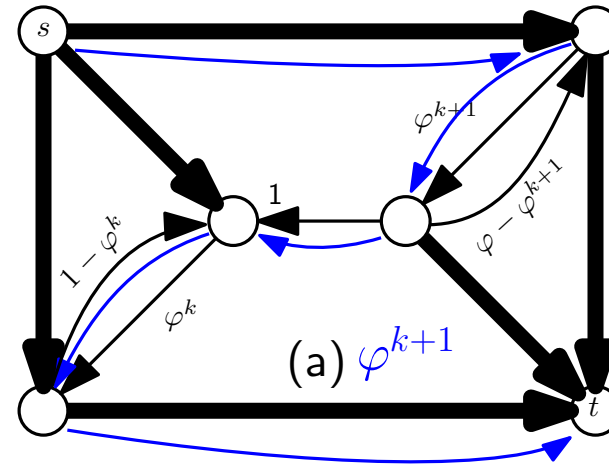


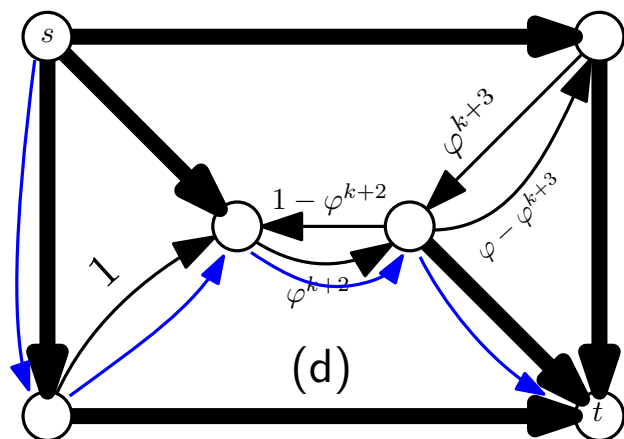
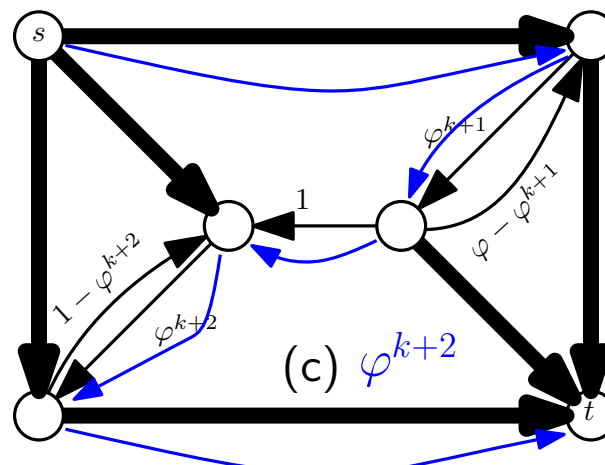
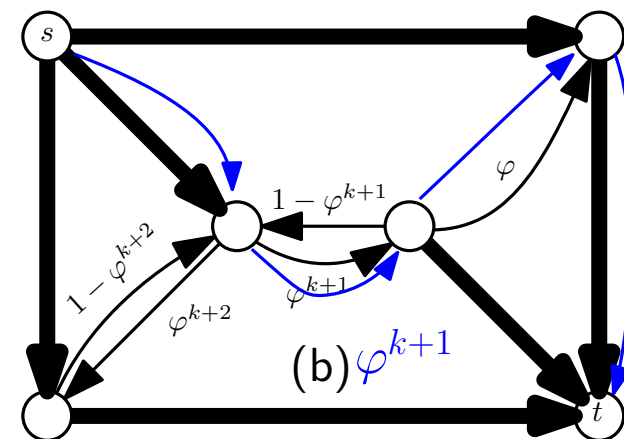
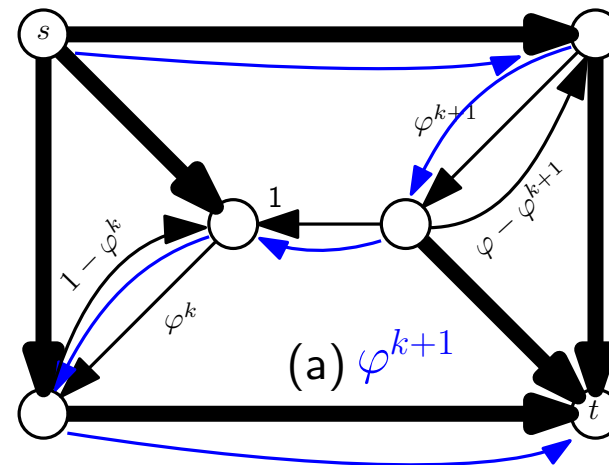


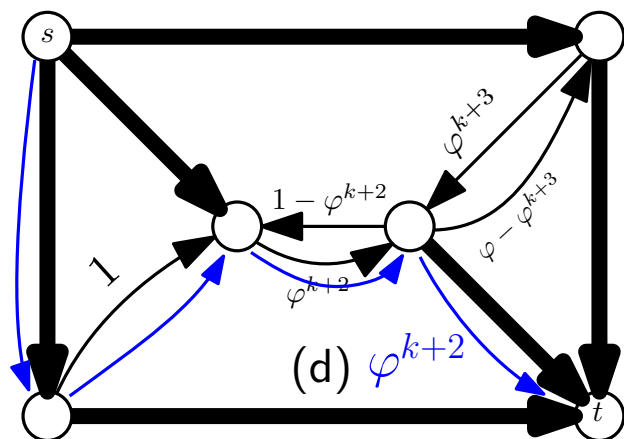
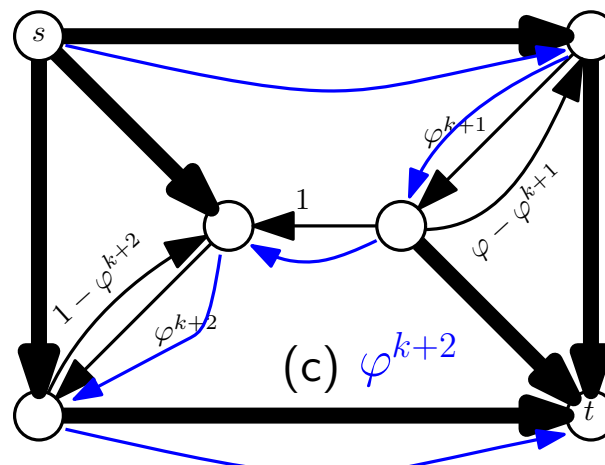
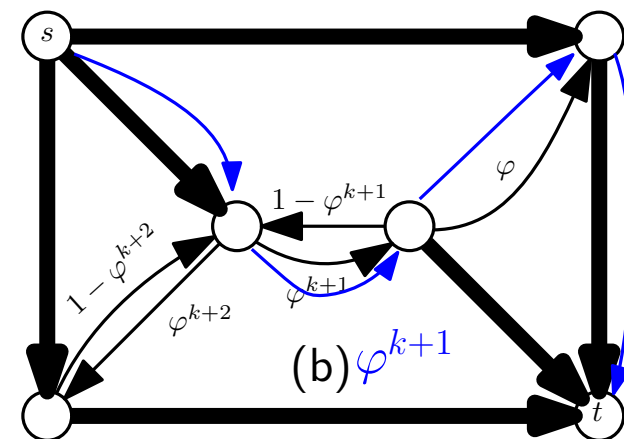
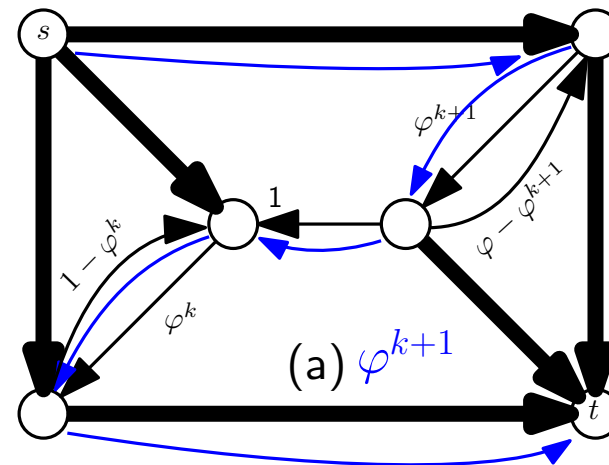


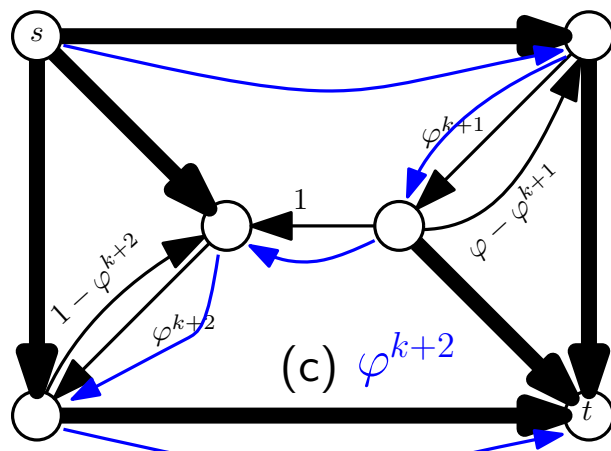
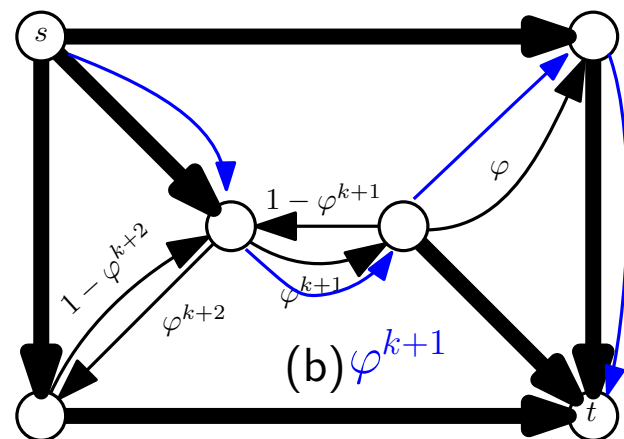
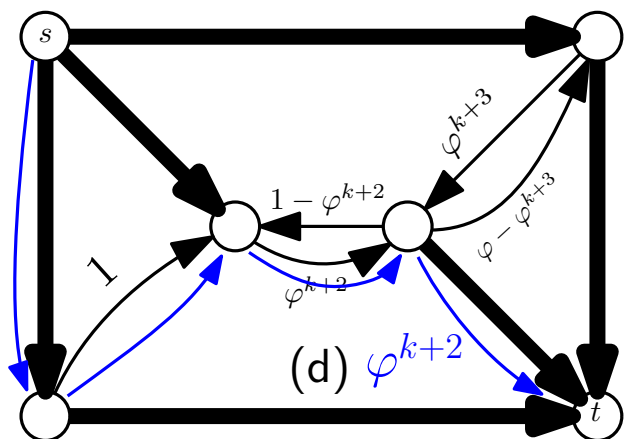
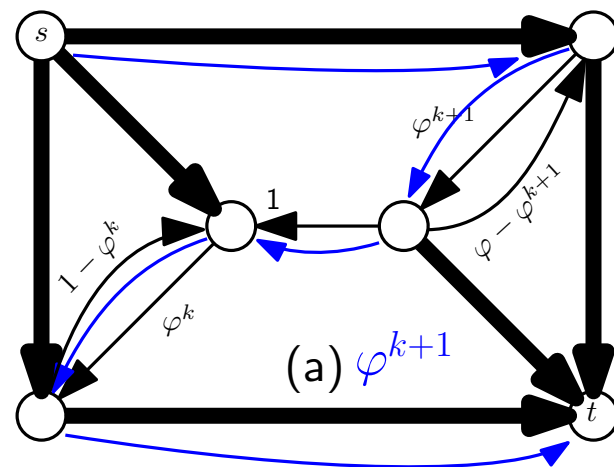
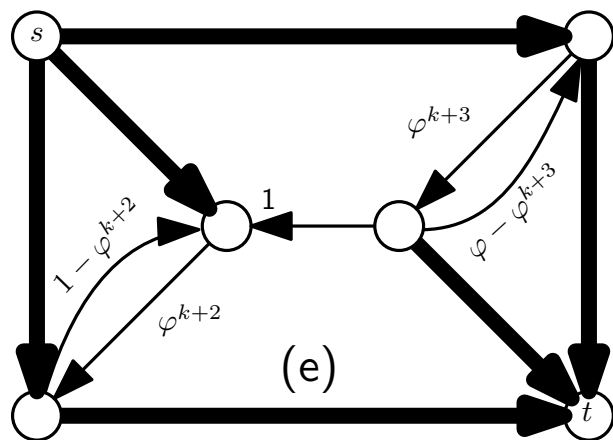


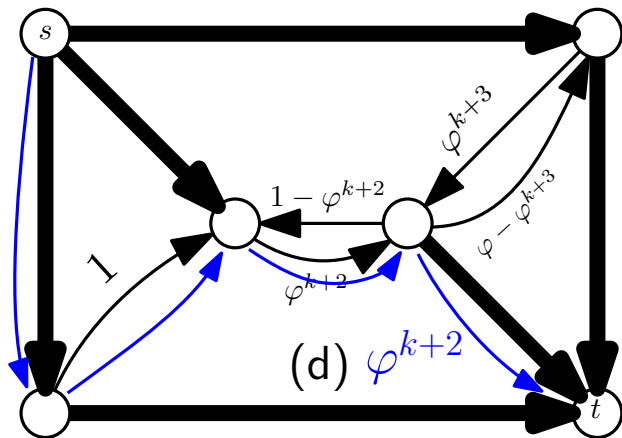
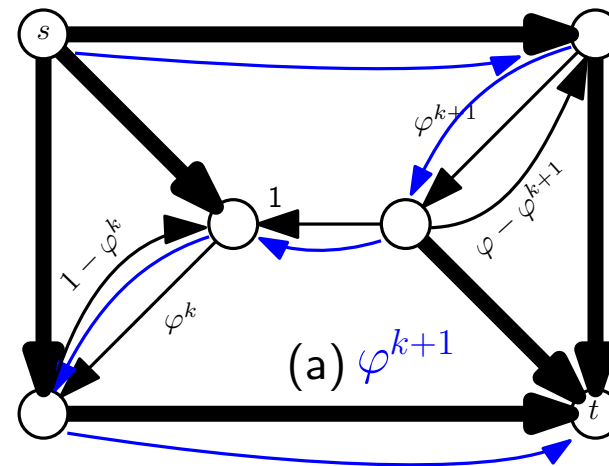
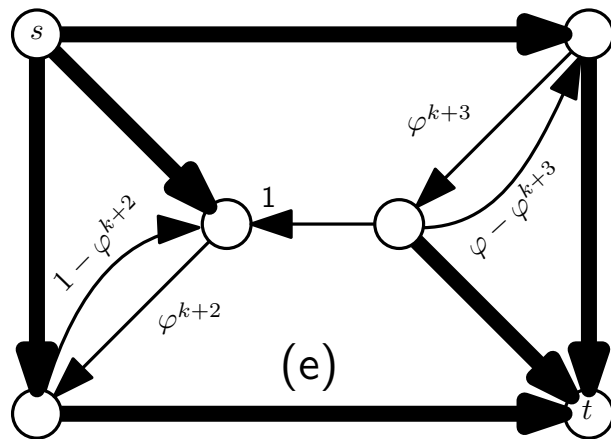




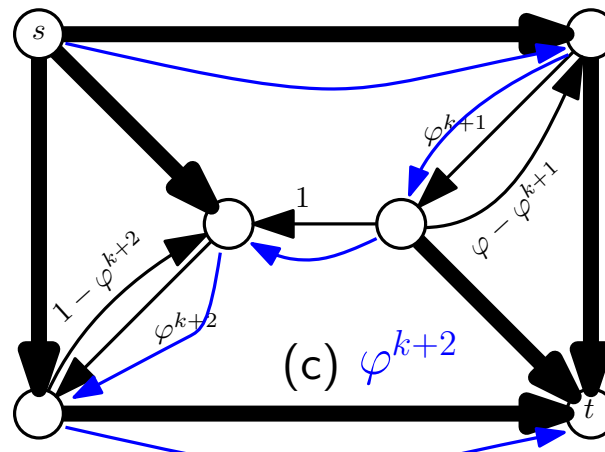
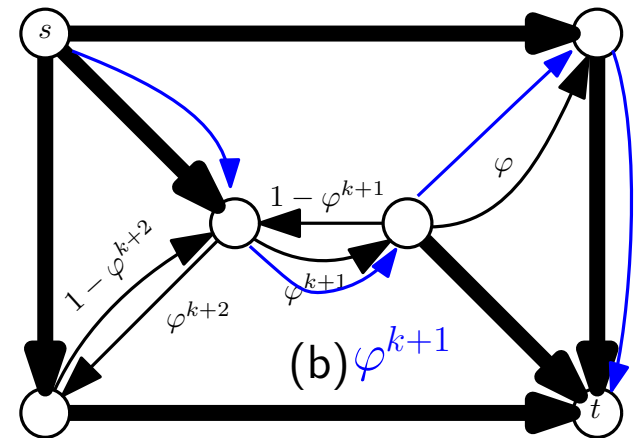




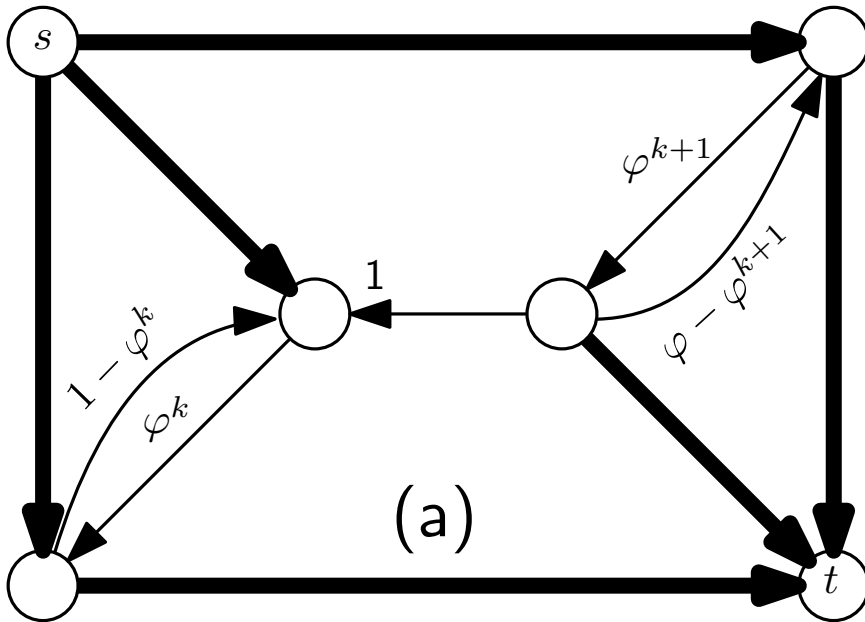




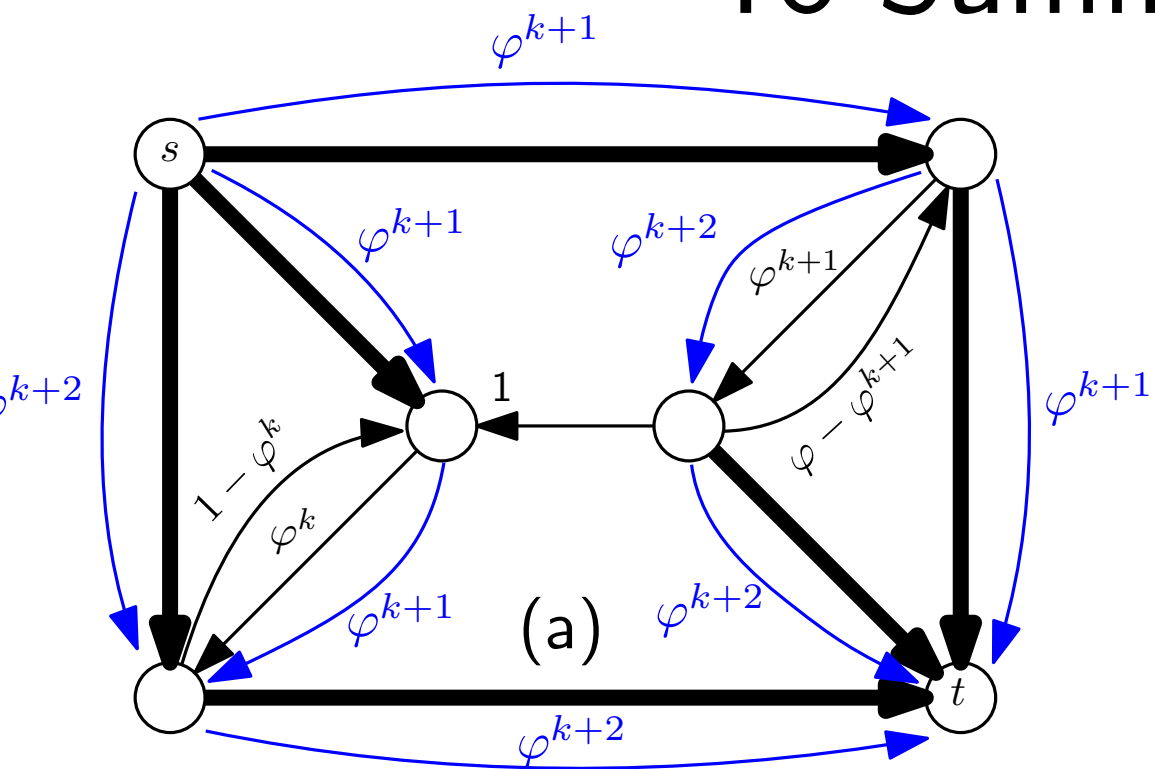
(e) equals (a), with k replaced by $k + 2$



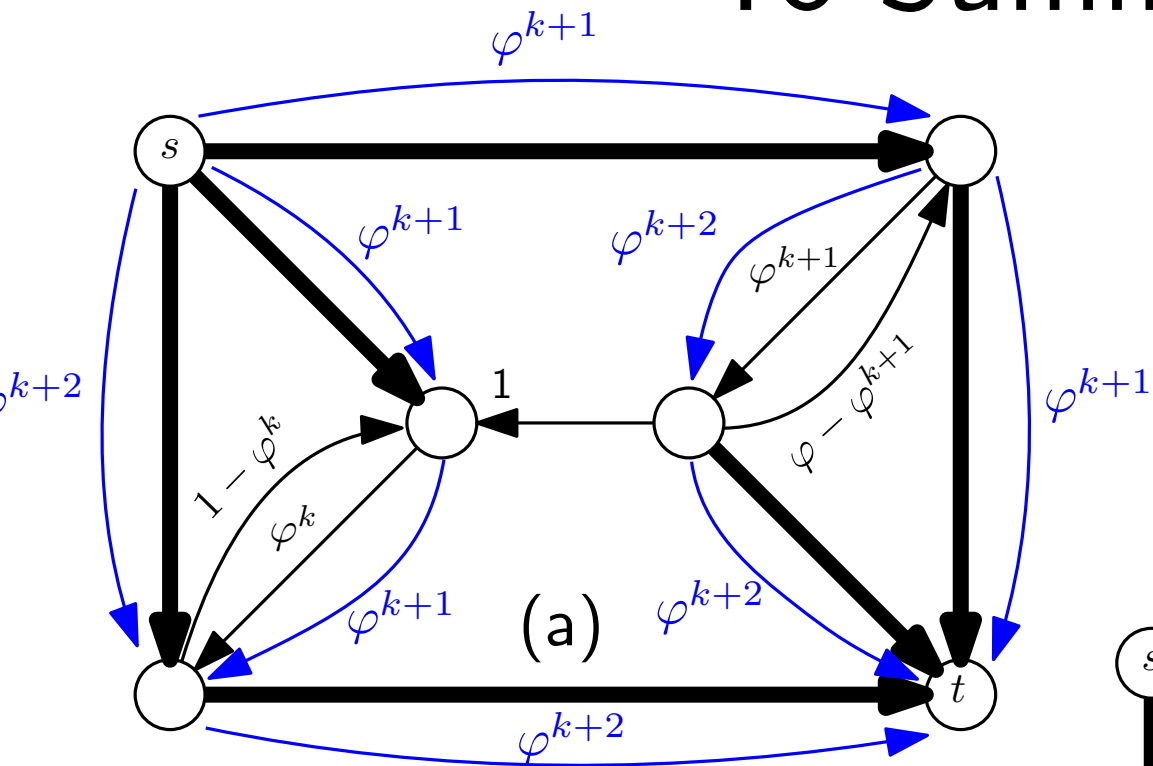
To Summarize



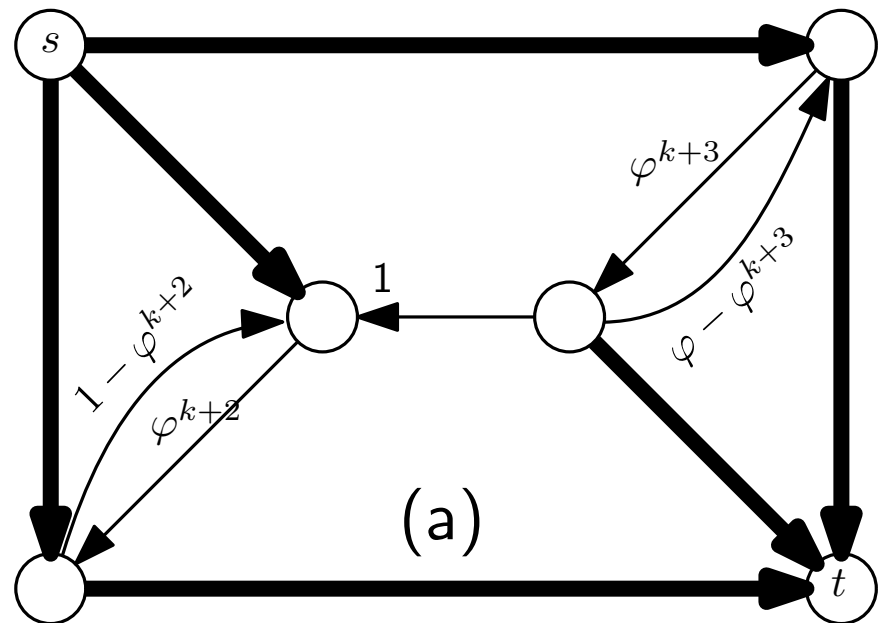
To Summarize



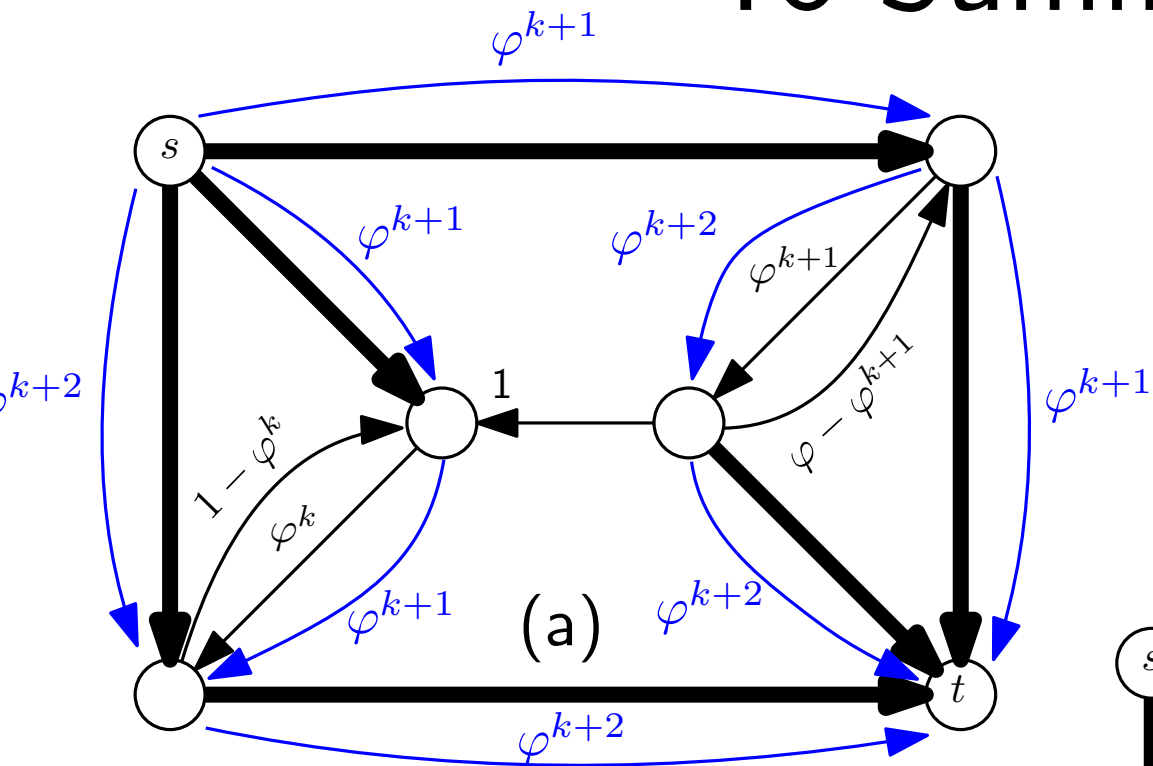
To Summarize



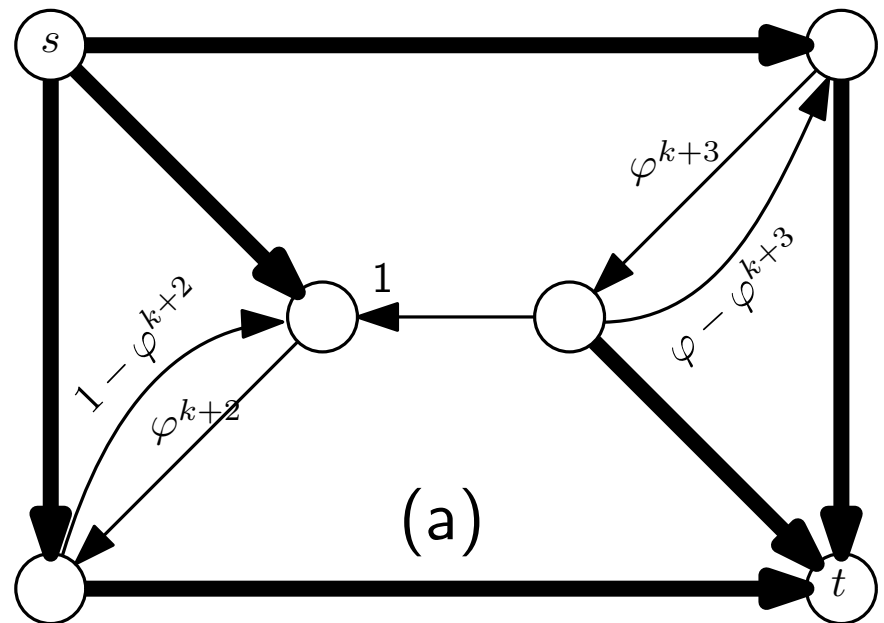
This flow has value
 $2\varphi^{k+1} + 2\varphi^{k+2}$



To Summarize



This flow has value
 $2\varphi^{k+1} + 2\varphi^{k+2} = 2\varphi^k$



To Summarize

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After $4t$ iterations, we get a flow of value

$$2 \sum_{k=0}^t \varphi^k$$

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This converges to $2 \cdot \frac{1}{1-\varphi} = \frac{2}{\varphi^2} = 2 + \varphi \approx 2.618$

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But maxflow is 2000.

