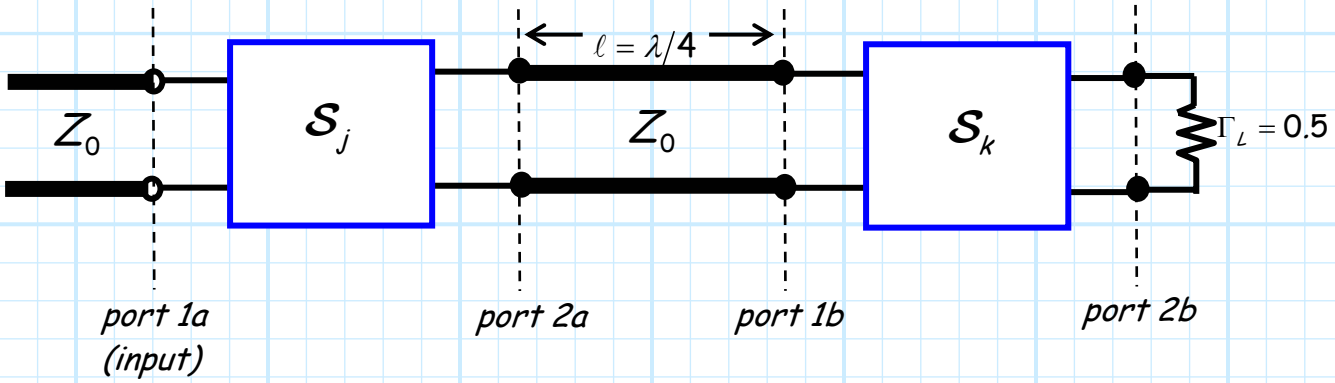
Special Problem 4.5-4

Below is a **single**-port device (with **input** at port 1a) constructed with two two-port devices ($\mathcal{S}_j$ and $\mathcal{S}_k$), a quarter wavelength transmission line, and a load impedance.



The scattering matrices of the two-port devices are:

$$\mathcal{S}_j = \begin{bmatrix} 0.35 & 0.5 \\ 0.5 & 0 \end{bmatrix} \qquad \mathcal{S}_k = \begin{bmatrix} 0 & 0.8 \\ 0.8 & 0.4 \end{bmatrix}$$

Using the nodes **below**, draw the complete **signal flow graph** of this circuit.

Then **reduce** the graph (on the **next** page!) to determine the **return loss** at the input port.