Special Problem II.A-21

Consider a **reciprocal** device with the following scattering matrix:

$$\bar{\bar{S}} = \begin{bmatrix} 0 & 0.5 & S_{13} \\ 0.5 & 0 & 0.6 \\ 0.4 & 0.6 & 0.2 \end{bmatrix}$$

a) Is this **device** matched ?

b) Determine S_{13} .

c) Say 10 mW is incident on port 1, and all other ports are terminated in matched loads. How much power will flow **out of** (i.e.,exit from) port 2? port 3?

d) Is this device **lossless**?

e) What is the **return loss** at port 3 if all other ports are matched ?