

### Special Problem 3.G-2

For a particular application using a directional coupler, we use a port denoted as port  $c$  as the **input**. Likewise, the remaining ports are arbitrarily denoted as:

The **coupled** port is port  $b$

The **through** port is port  $a$

The **isolation** port is port  $d$

We also know the following scattering parameters:

$$S_{ac} = 0.8$$

$$S_{bc} = j0.5$$

$$S_{cc} = 0.1$$

$$S_{dc} = 0.01$$

Determine:

- the **coupling** of this device.
- the **isolation** of this device.
- the **mainline loss** of the device.
- the **coupling loss** of the device.
- the **insertion loss** of the device.
- the **directivity** of this device.