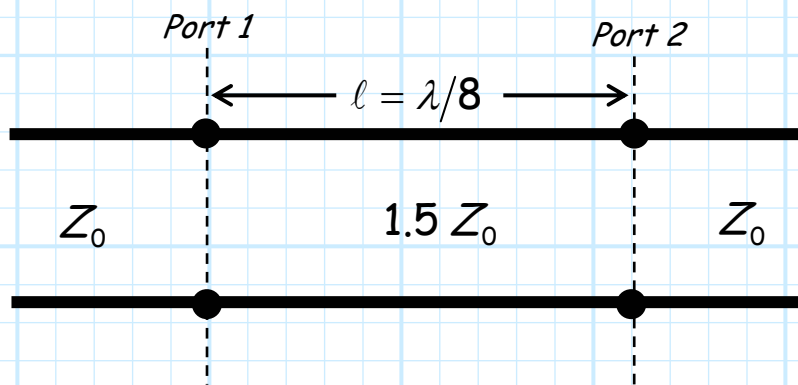


**Special Problem 5.5-2**

Consider the following **lossless, reciprocal**, two-port device, consisting of a length of transmission line with characteristic impedance  $1.5 Z_0$  and length  $\ell = \lambda/8$ .



1. Use the **theory of small reflections** to determine an **approximate** value of  $S_{11}$  for this two-port device (you **must** use the theory of small reflections to determine  $S_{11}$ —you will receive **no credit** if you use any **other method**!).
2. Using your solution for  $S_{11}$ , determine  $S_{22}$ ,  $|S_{21}|$ , and  $|S_{12}|$ .