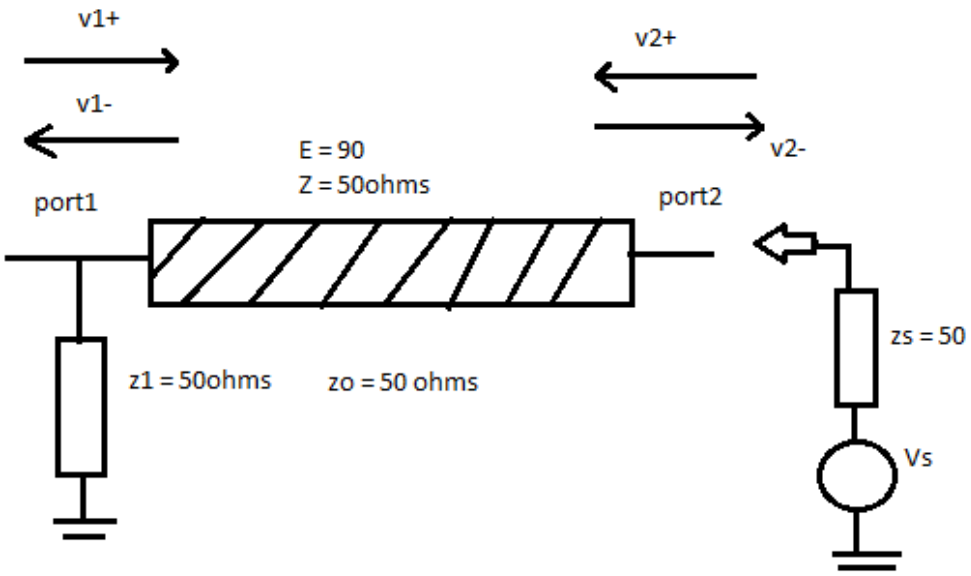

Find s_{12}

$S_{22}=0.33<0$

$S_{11}=0.33<180$

$S_{21}=0.67<-90$

My Solution:

$$v_2^+ = \frac{vs}{2} < 0$$

$$v_2^- = \frac{vs}{2} < 0 \times (s_{22}) = 0.165\, vs < 0$$

$$v_2 = v_2^+ + v_2^- = 0.665\, vs < 0$$

$$v_1^- = (v_2^+ - v_2^-) < -90 = 0.335 vs < -90$$

$\gamma_l = \frac{zl-zo}{zl+zo} = 0.33 < 180$ (load reflection coefficient looking in port 2)

$v_1^+ = \gamma_{l \times v_1^-} = 0.11055 vs < 90$

$v_{1=v_1^+} + v_{1=0.23vs} < -90$

$$s_{12} = \frac{v_1}{v_2} \times (1 + s_{22}) = 0.47 < -90$$