6.2
\[ Z_0 = 75\,\Omega \text{ and } Z_L = 150 + 360\,\Omega \Rightarrow \frac{Z_L}{Z_0} = 2 + j0.9\,\Omega \]

a) locate \( Z = 2 + j0.9\,\Omega \), and then rotate on constant \( \Gamma \) arc to \( 45^\circ \) and read \( \text{vswr} = 2.4 \) at the position of voltage maximum

b) distance traveled toward generator to voltage maximum is \( 0.25\lambda - 0.2175\lambda = 0.0325\lambda \)

c) \( \Gamma_L = \frac{\Gamma - \Gamma_0}{\Gamma + \Gamma_0} = \frac{-j\frac{Z_L}{Z_0} - j}{j\frac{Z_L}{Z_0} + j} = -\Gamma_v \), i.e., \( 180^\circ \)

Note: phase shift \( \Rightarrow \Delta \Gamma_L = -\left[180^\circ - (23.5^\circ)\right] = -156.5^\circ \)

6.7

to find \( V_{\text{max}} \), \( \frac{Z_L}{Z_0} = \frac{6.25 - j7.50\,\Omega}{Z_0} = 6.25 - j7.50\,\Omega \) is located on the Smith chart as in problem 6.2 and then rotated on the constant \( \Gamma_L \) arc to the \( 45^\circ = 0 \) axis, the \( \Gamma_0 \) is \( 0.263\lambda \) and \( \text{vswr} = \left[0.50 - (0.263 - 0.250)\right] \lambda = 0.487\lambda \) to place the loci of \( \Gamma_L \) on real axis where \( Z_{\text{in}} = Z_0 S = (20)(18) = 360\,\Omega \) (real)

6.9
locate \( \Gamma_L = 0.6 / 52^\circ \) on Smith chart. Now, rotate \( 0.115\lambda \) WTL \( \Rightarrow 0.32\lambda + 0.115\lambda = 0.435\lambda \)
\[ \Rightarrow \Gamma_L = 0.6 / 133^\circ \]

now at \( \Gamma_L \), read \( \frac{Z_L}{Z_0} = 0.3 + j0.4 \)

\[ Z_L = Z_0 \frac{Z_L}{Z_0} = 15 + j20\,\Omega \]

to find \( \text{vswr} \), rotate \( \Gamma_L \) along constant radius to intercept the real axis \( \text{vswr} = 4.2 \) (\( \approx 5 \))

Note that to move to \( V_{\text{max}} \) requires a \( 0.32\lambda - 0.25\lambda = 0.07\lambda \)
rotation to generator and then \( Z_{\text{in}} = Z_0 S = 50(4.2) = 210\,\Omega \) (real)