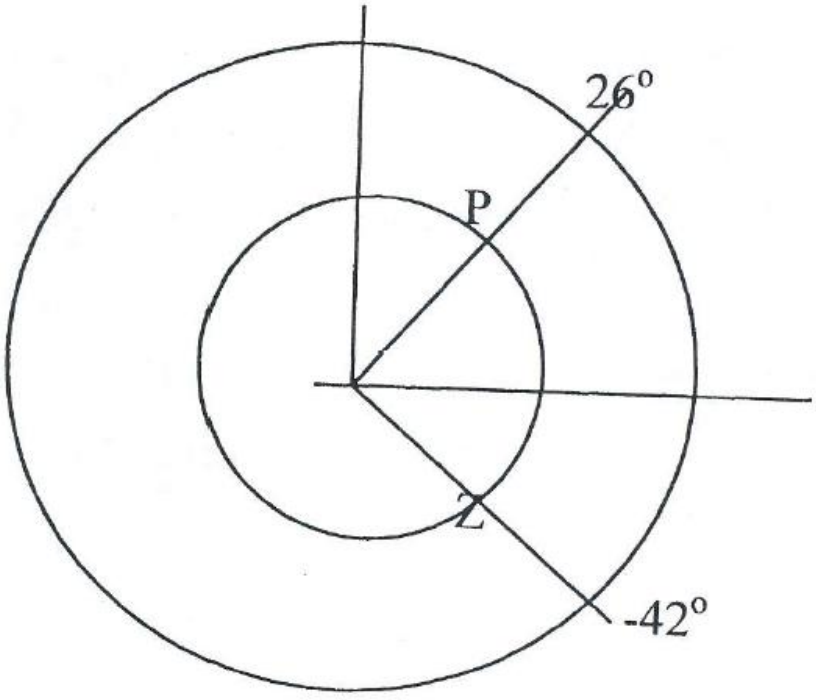
Prob. 11.28

$$z_L = \frac{Z_L}{Z_o} = \frac{100 + j150}{50} = 2 + j3$$

$$z_{in} = \frac{Z_{in}}{Z_o} = \frac{50 + j110}{50} = 1 + j2.2$$

$$\theta = 26^o - -42^o = 68^o$$

If $720 \rightarrow \lambda$, $\quad 68^o \rightarrow d = \frac{\lambda}{720^o} 68^o = \underline{0.0944\lambda}$



Prob. 11.34

(a) $$z_L = \frac{Z_L}{Z_o} = \frac{75 + j60}{50} = 1.5 + j1.2$$

$$|\Gamma| = \frac{OP}{OQ} = \frac{3.8\text{cm}}{8\text{cm}} = 0.475, \qquad \theta_\Gamma = 42^o$$

$$\Gamma = \underline{0.475\angle 42^0}$$

(Exact value = $0.4688 \angle 41.76^o$)

(b) s=2.8

(Exact value = 2.765)

(c) $$0.2\lambda \rightarrow 0.2x720^o = 144^o$$

$$z_{in} = 0.55 - j0.65$$

$$Z_{in} = Z_o z_{in} = 50(0.55 + j0.65) = \underline{27.5 + j32.5\ \Omega}$$

(d) Since $\theta_\Gamma = 42^o$, V_{min} occurs at

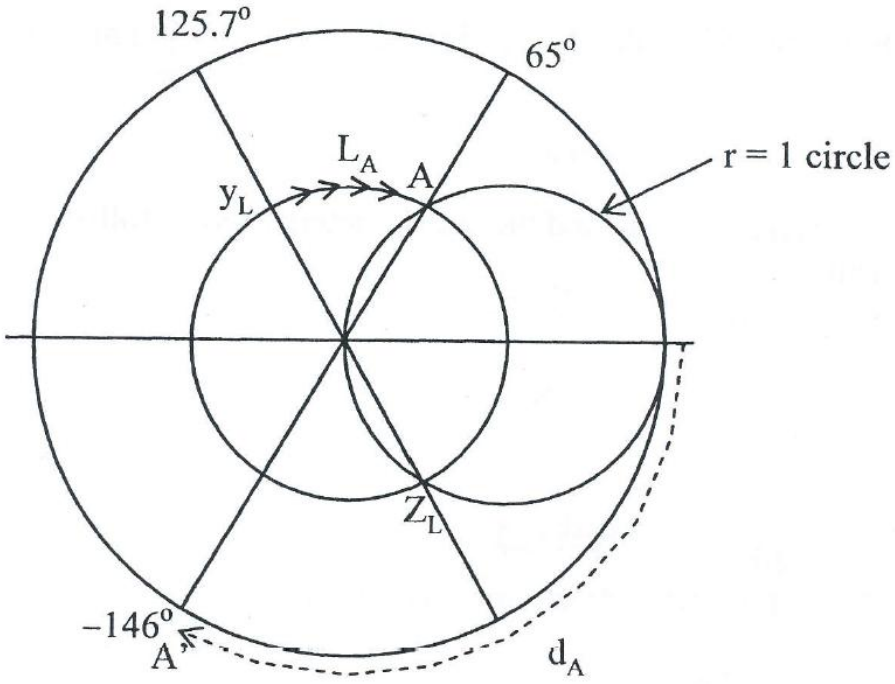
$$\frac{42}{720}\lambda = \underline{0.05833\lambda}$$

(e) same as in (d), i.e.. $\underline{0.05833\lambda}$

Prob. 11.46

$$z_L = \frac{Z_L}{Z_o} = \frac{60 - j50}{50} = 1.2 - j1$$

$$y_L = \frac{1}{z_L}$$



At A, $y = 1 + j0.92$, $y_s = -j0.92$

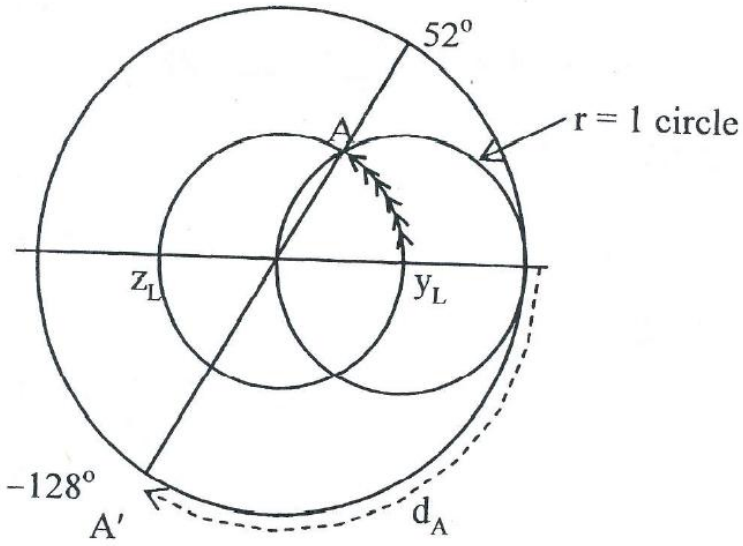
$$Y_s = Y_o y_s = \frac{-j0.92}{50} = \underline{\underline{-j18.4\ \text{mS}}}$$

Stub length = $\underline{\underline{0.1307\lambda}}$

Stub position = $\underline{\underline{0.0843\lambda}}$

Prob. 11.49

$$\frac{\lambda}{4} \rightarrow \frac{720^o}{4} = 180^o$$



At A, $y = 1 + j1.5,\ y_s = -j1.5 \rightarrow Y_s = y_s Y_o = -j1.5 Y_o$

$$d_A = \frac{128^o \lambda}{720^o} = \underline{\underline{0.1778\lambda}}$$

$$\ell_A = \frac{52^o}{720^o}\lambda = \underline{\underline{0.0722\lambda}}$$

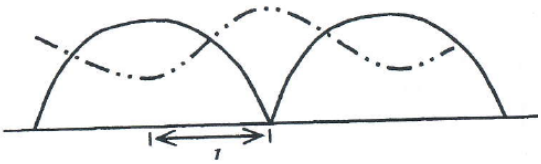
Prob. 11.52

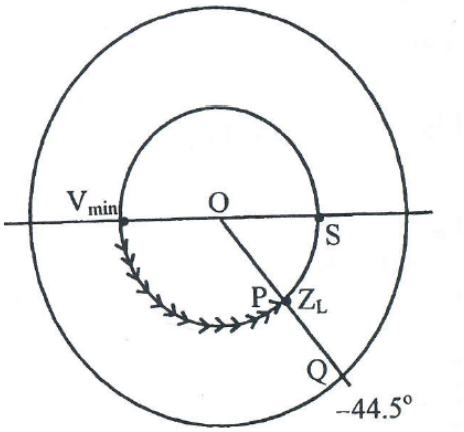
$$s = \frac{V_{max}}{V_{min}} = \frac{0.95}{0.45} = \underline{\underline{2.11}}$$

$$\frac{\lambda}{2} = 22.5 - 14 = 8.5 \quad \rightarrow \quad \lambda = 17 \text{ cm}$$

$$f = \frac{c}{\lambda} = \frac{3 \times 10^8}{0.17} = \underline{\underline{1.764 \text{ GHz}}}$$

$$l = 3.2 \text{ cm} = \frac{3.2}{17}\lambda \rightarrow 135.5^\circ$$





At P, $z_L = 1.4 - j0.8$

$$Z_L = 50(1.4 - j0.8) = \underline{\underline{70 - j40\Omega}}$$

(Exact value = 70.606-j40.496 Ω)

$$|\Gamma| = \frac{s-1}{s+1} = \frac{1.11}{3.11} = 0.357, \qquad \theta_\Gamma = -44.5^\circ$$

$$\Gamma = \underline{\underline{0.357\angle -44.5^\circ}}$$

(Exact value = 0.3571∠-44.471°)