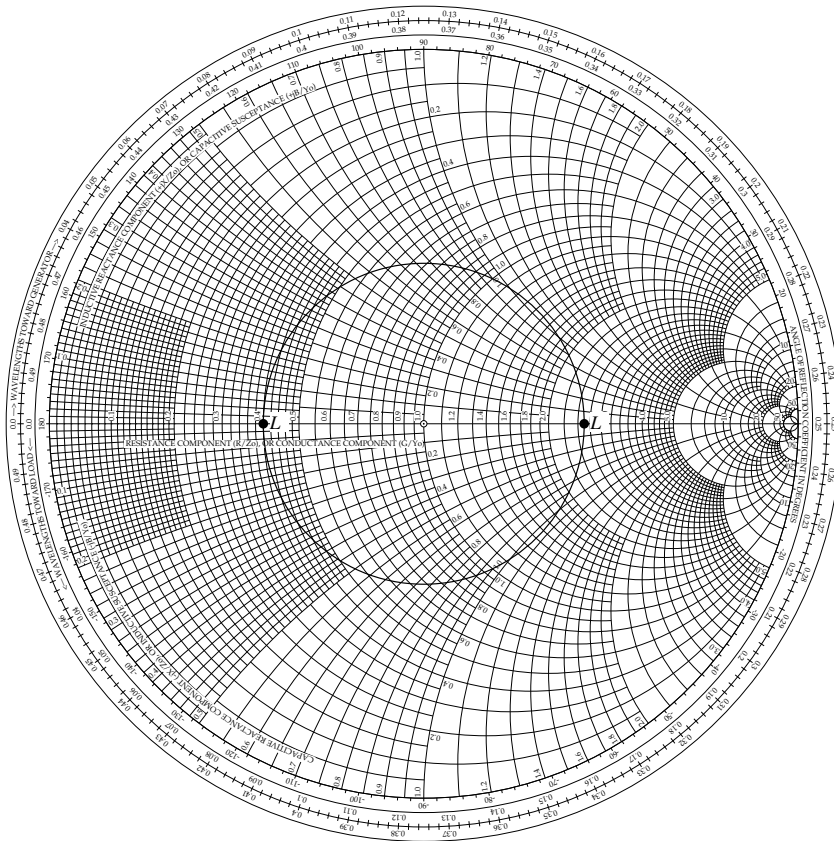


**2.53** On a lossless transmission line terminated in a load  $Z_L = 100\ \Omega$ , the standing-wave ratio was measured to be 2.5. Use the Smith chart to find the two possible values of  $Z_0$ .

**Solution:** Refer to Fig. P2.53.  $S = 2.5$  is at point  $L1$  and the constant SWR circle is shown.  $z_L$  is real at only two places on the SWR circle, at  $L1$ , where  $z_L = S = 2.5$ , and  $L2$ , where  $z_L = 1/S = 0.4$ . so  $Z_{01} = Z_L/z_{L1} = 100\ \Omega/2.5 = 40\ \Omega$  and  $Z_{02} = Z_L/z_{L2} = 100\ \Omega/0.4 = 250\ \Omega$ .



**Figure P2.53:** Solution of Problem 2.53.