HW #4

P1. Problem 2.47 in 8/E, 7/E, and 6/E, i.e. 2.35 in 5/E and Answer Sheet

2.47 Use the Smith chart to find the reflection coefficient corresponding to a load impedance of

(a) \( Z_L = 3Z_0 \)
(b) \( Z_L = (2 - j2)Z_0 \)
(c) \( Z_L = -j2Z_0 \)
(d) \( Z_L = 0 \) (short circuit)

P2. Problem 2.49 in 8/E, 7/E, and 6/E, i.e. 2.36 in 5/E and Answer Sheet

2.49 Use the Smith chart to find the normalized load impedance corresponding to a reflection coefficient of

(a) \( \Gamma = 0.5 \)
(b) \( \Gamma = 0.5/e^{60^\circ} \)
(c) \( \Gamma = -1 \)
(d) \( \Gamma = 0.3/e^{-30^\circ} \)
(e) \( \Gamma = 0 \)
(f) \( \Gamma = j \)

P3. Problem 2.52 in 8/E, 7/E, and 6/E, i.e. 2.37 in 5/E and Answer Sheet

2.37 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 \( Z_0 \).

P4. Problem 2.55 in 8/E, 7/E, and 6/E, i.e. 2.39 in 5/E and Answer Sheet

2.39 A lossless 50-\( \Omega \) transmission line is terminated in a short circuit. Use the Smith chart to find the following:

(a) The input impedance at a distance 2.3\( \lambda \) from the load.

(b) The distance from the load at which the input admittance is \( Y_{in} = -j0.04 \, S \).
P5. Problem 2.58(a) in 8/E, 7/E, and 6/E, i.e. 2.41(a) in 5/E and Answer Sheet

2.41* A lossless 100-Ω transmission line 3λ/8 in length is terminated in an unknown impedance. If the input impedance is \( Z_{\text{in}} = -j2.5 \ \Omega \),

(a) Use the Smith chart to find \( Z_L \).