1) Let's normalize; divide by Z_0 to Z_L.

$$\frac{Z_L}{Z_0} = \frac{60+40j}{50} = 1.2+0.8j$$

2) Regular circles are real part; rightcircles are imaginary ones.

3) Plot the real & imaginary parts; search the line where both circles intersect and draw the circle from origin with that point.

4) Now, $\Gamma = 2.088$ (Draw the line with origin & the point of intersec^n in above) After that measure the length of radii of both circles smaller & bigger).

Now $\frac{\text{radii of smaller}}{\text{radii of bigger}} \approx \Gamma$.

5) For S, the circle where meets the on smith c. which goes to infinity. that point is SWR.

6) Now, for Z_L, $\lambda = \frac{v}{f}$ calculate it. $\lambda = \frac{0.6c}{f}$

So m now $l = 30m$ is given, length of wire in terms of $\lambda = \frac{\lambda}{3}$

$\because \lambda$ corresponds to 720° on smithchart. $\therefore \frac{720}{3} = 240°$.

Now take the Z_L line as base and measure 240° from it. Then extend that point from origin to outer circle.

7) Now, take the 2 points where the line intersects inner & outer circle. Real & imaginary part. Convert it to polar & compare.

8) The Z_L line intersects to outer circle for angle θ in 'Γ'