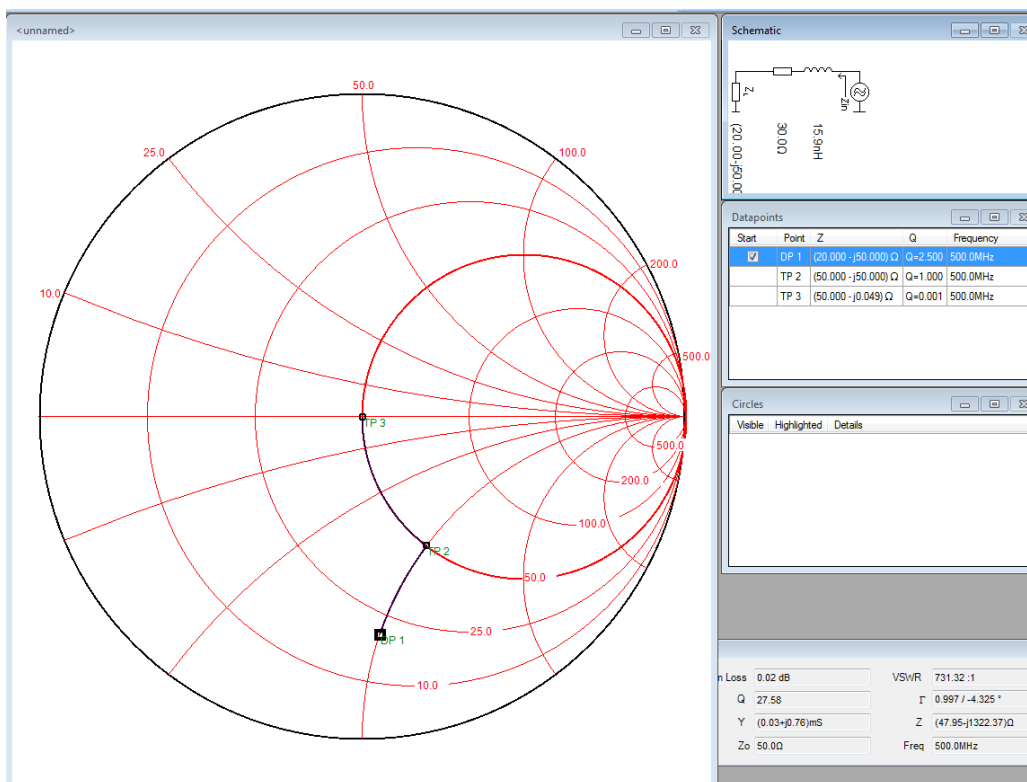# RF Training: Numerical Analysis

Impedance-matching Exercises in the *Smith* Chart (Solutions)

1.)

Z_L	C Series	L Series	R Series
Z = (50 + j25) Ω	12.7 pF	-	-
Z = (50 - j25) Ω	-	8 nH	-
Z = (4 + j21) Ω	15.2 pF	-	46 Ω
Z = (20 − j50) Ω	-	15.9 nH	30 Ω

Screenshot of the last solution:

2.)

Z_L	C Shunt	L Shunt	R Shunt
Z = (50 + j25) Ω	2.5 pF	-	257 Ω
Z = (50 - j25) Ω	-	39.8 nH	257 Ω
Z = (4 + j21) Ω	14.6 pF	-	89.8 Ω
Z = (20 − j50) Ω	-	18.5 nH	76 Ω

3.) Multiple solutions are possible. The first element (closest to Z_L) is marked with a *.

Z_L	C Series	L Series	C Shunt	L Shunt
Z = (32 − j66) Ω	-	24.5 nH	-	101.3 nH*
Z = (13 − j9) Ω	24.5 pF*	-	-	9.5 nH
Z = (37 + j34) Ω	26 pF*	-	3.8 pF	-
Z = (78 + j78) Ω	4.4 pF	-	-	108 nH*

4.) Multiple solutions are possible.

λ=0.3352| 201.0mm (electr.)
25.0Ω| 201.0mm (mech)

λ=0.0255| 15.3mm (electr.)
50.0Ω| 15.3mm (mech)

Z_L (17.00-j18.00)Ω@500.0MHz