Smith Chart Tutorial

Objective

To understand the construction of smith chart and plot certain points and regions on it

Question1 : What are the advantages of smith chart?

Question 2 : What are the disadvantages of smith chart

Question3 : What is normalized impedance

Question 4: Write a formula, which provides relation between impedance and reflection coefficient

Question 6 : Smith chart is drawn on which plane

Question 5: Draw Impedance plane and plot

- 24+j45   -12-32j   -22+2j
- Using a marker , highlight the area which is not valid for smith chart and provide the reason as well

Write down the values of reflection coefficient and R when
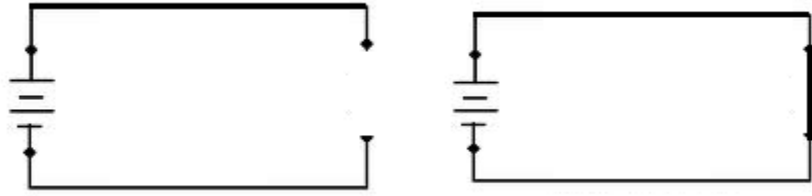
For the above values of reflection coefficient , plot the values on graph

Find the values for following.

Constant resistance circles				Constant Reactance Circle			
Values	Center		Radius	Values	Center		Radius
	X axis	Y axis	1/(r+1)		X axis	Y axis	1/x
R	R/(R+1)	0		X	1	1/x	
0		0		0	1		
0.5		0		0.5	1		
1		0		1	1		
2		0		2	1		
10		0		3	1		
infinity		0		4	1		

Step 1

Using the complex gamma plane , draw the above circles, Make sure to keep big scale , and use different colors for both set of circle .
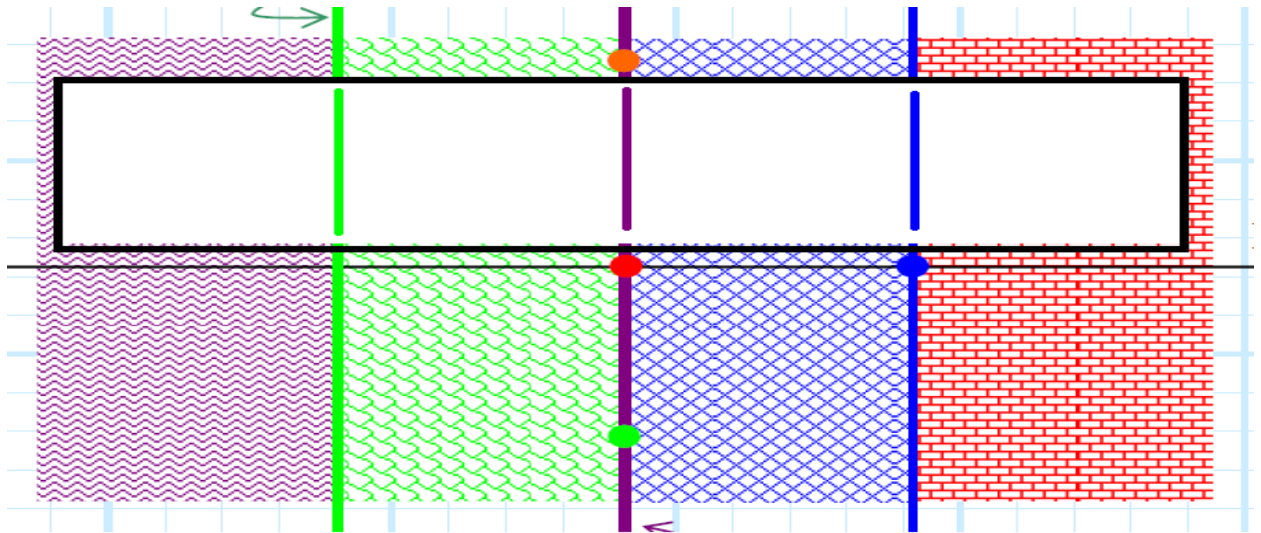
Step 2

Mapping on Circle

Step 3

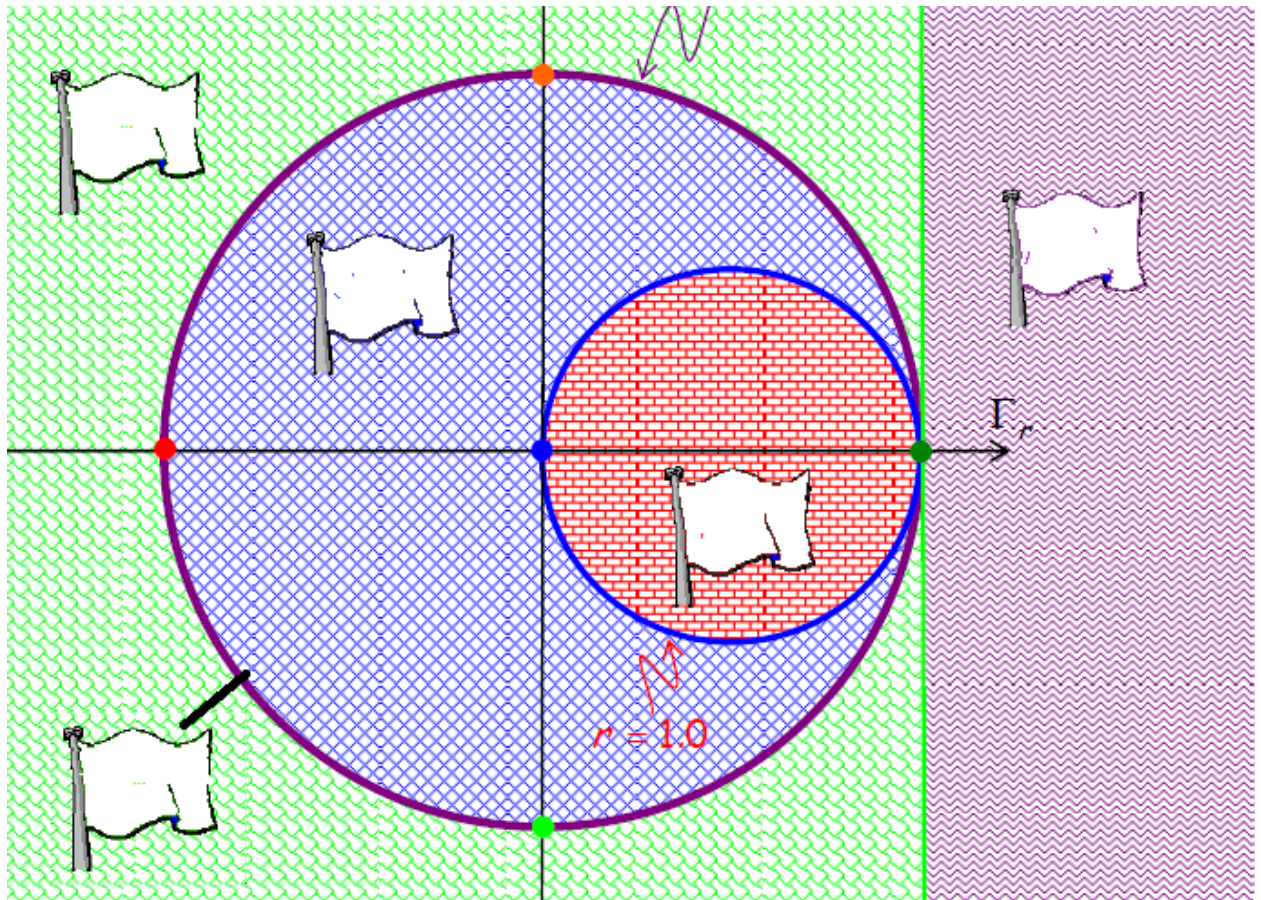Draw ive image of reactance circle

Step 4

Cancel the invalid areas , and show the final result .
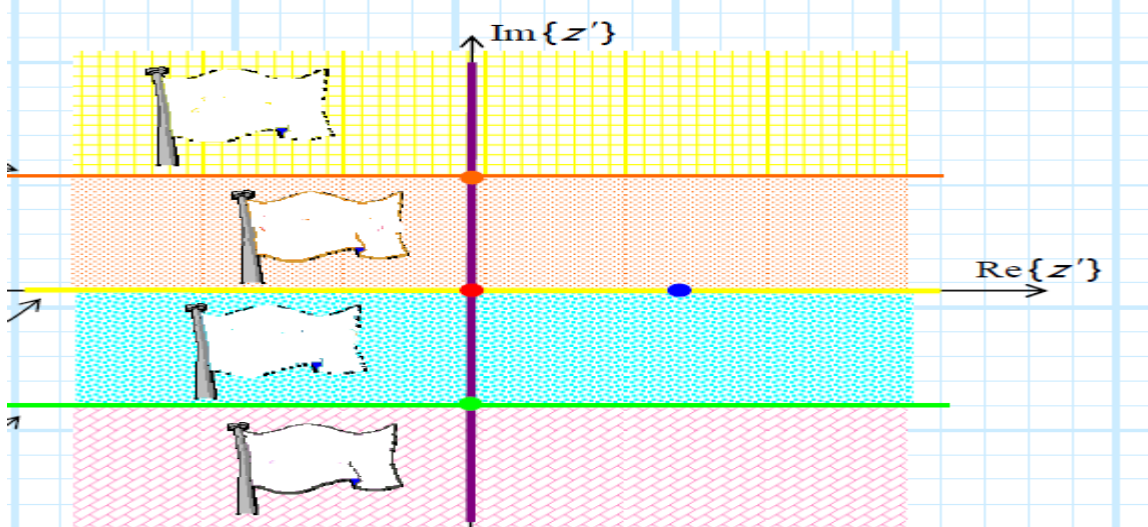
MAPPING POINTS ON SMITH CHART

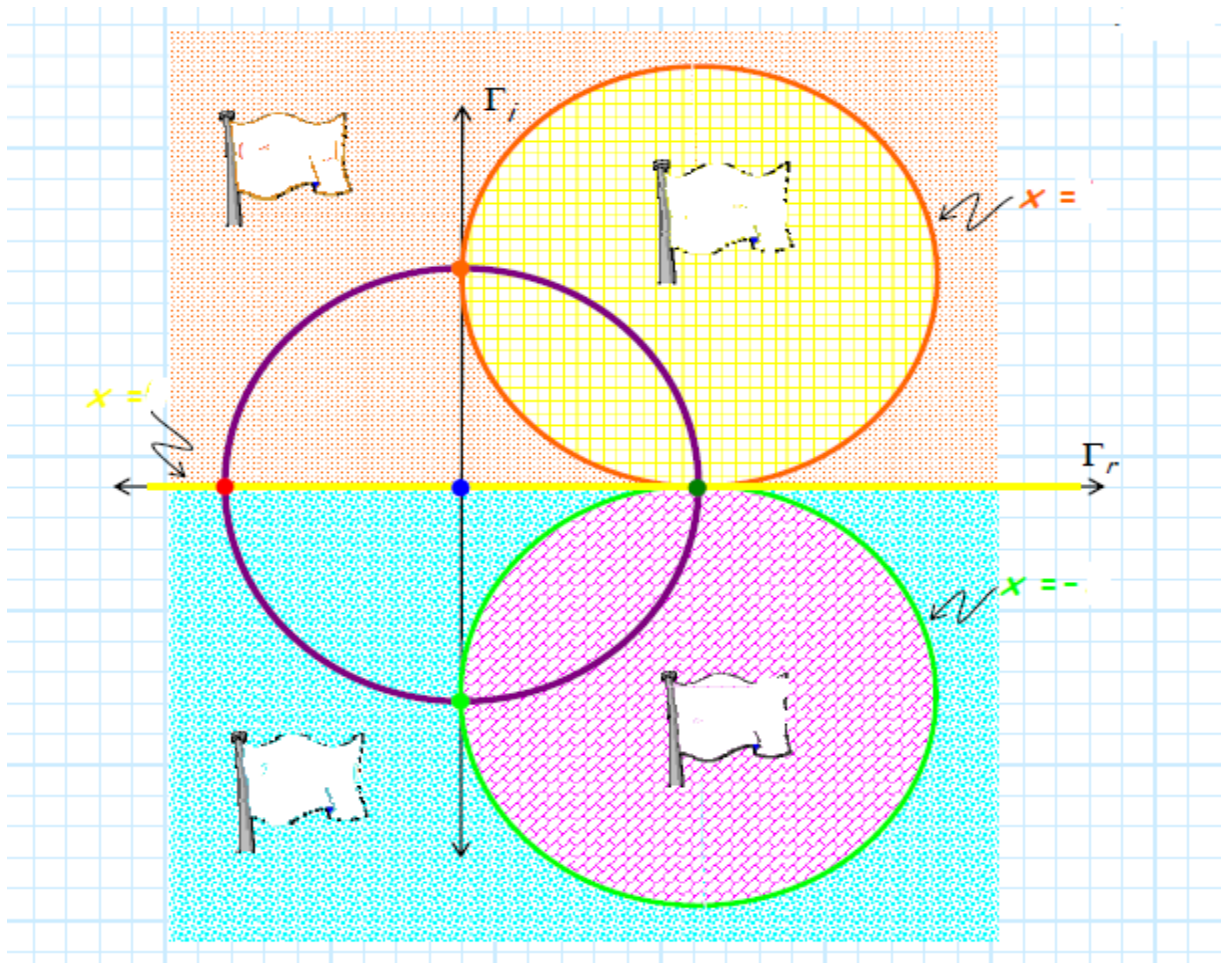For the following graph map General values of R in these portions

Write the Value of R , if same region above needs to be plotted in below

$r = 1.0$

Γ_r

For the following graph map General values of R in these portions

Write the Value of x , if same region above needs to be plotted in below

You will observe that out of all points we have plotted, we are getting a combination of 16 points, out of which 8 are valid. You are required to mark these points in graph below