Root Locus	
Q(x)	
Step 1) Write characteristic equation in the form: 11 kgs) with Go) = P(D)	
Example: 3+5+1	
Example: 52+5+1 (s3+45+KS+1)	
Chanacteristic equation	
Group k terms.	
, 3	
(53+40+2)+K0=0	
Divide earlien by Now-k terms:	
(s <sup>3</sup> +45+2) + KS = 1+ K S +0 (s <sup>3</sup> +45+2) (s <sup>3</sup> +45+2) (s <sup>3</sup> +45+2)	
(2 6 (N) = 3+4N +2	
Q 11)= 5+4n+2	
Step 2: Sketch poles and Zeroes of GW in the s-plane Jwko	
Step 2. Stetch poles apis serves of Give the Suprape swee	
As K increases from 0 to 00 the roots move from the poles of Gins to	the zeroes of Gini
If there are more poles than zeroes, consider New Zeroes in oo. If to	here are more zeroes than poles, 200 poles
in ∞.	
Step 3: Toentify sections of the real axis that make up the root loci	
From 100 to-00, the roof locus exists tothe left of every odd	Number of Open loop Zeroes + open loop Poles
Example:	
G(s)= \( \frac{1}{5} \)	
7:0 P,=-0,246	
P3=0,123-2,011	·····
35.0,123+2,00	; \
	1
12ero +3 poles to 0	0.17
the right, so poes Not belows to root loci	or poles to the left, so  Not part of root loci
	TPoles to the min
- a	Not belove to the most loci
	<u></u>

Step 4: Identify the assymptotes:
The assymptote is Defined by 2 equations:
*-axis crossing. o= <u>E finite poles-5 finite zeros</u> # finite poles-# finite zeros
anele of assymptote: 0= (2K+1) T' # finite poles-#finite zeroes
for our Example, there are 2 Non-paired poles.
7:0 0:123+0:123-0:246 = 0  P1:-0:246  P1:0:123+2i
P3=0,123-20 0= (2.0+1)7 1/2
母: (2.1+1)が- 3か:-か/2 3-1