

0-17 Root Locus: locus of roots of $d(s) + k n(s)$ as k varies.
 8 cases: $k > 0$ +ve feedback leading coeff of n is +1
 $k < 0$ -ve feedback leading coeff of n is -1.

Assumption: $d(s)$ is monic.

↓
 -ve feedback $d + kn$
 +ve feedback $d - kn$

Thus finally,

all 8 cases are about: either $k \cdot n(s)$ has leading coeff
 +ve or -ve and this is
 added to (or subtracted) fixed $d(s)$.

Root Locus:

Starts from pole & goes to zero

for $k > 0$: $k : 0 \rightarrow +\infty$

& also for $k < 0$: $k : 0 \rightarrow -\infty$.

always starts from $k=0$

direction of branches

k changing from 0 to $+\infty$

(& then $k \rightarrow +\infty$
 or $k \rightarrow -\infty$)

Details Needed

in Root Locus:

- asymptotes: angles, point of intersection
- Breakaway & break-in points
- Real axis segments
- clearly marked direction, clearly marked pole (as X) & zero (as O)
- angle of departure and/or angle of arrival.