

Nyquist Plot:

- 1) Count how many number of poles of $G(s)H(s)$ are in right half of s -plane i.e. with positive real part. This is value of P .
- 2) Decide the stability criteria as $N = -P$ i.e. how many times Nyquist plot should encircle $-1 + j0$ point for absolute stability.
- 3) Select Nyquist path as per function $G(s)H(s)$.
- 4) Analyse the sections as starting point & termination point of plot.
Last section analysis not required.
- 5) Mathematically find out ω_{pc} & intersection of Nyquist plot with negative real axis by rationalizing $G(j\omega)H(j\omega)$.
- 6) From step 4 & 5, sketch the Nyquist plot.
- 7) Count the number of encirclements N of $-1 + j0$ by Nyquist plot. If this matches with criterion decided in step 2 system is stable, otherwise unstable.

$$G.M. = \frac{1}{|OS|} \quad \text{where}$$

Q = Intersection point of Nyquist plot with -ve real axis obtained in step 5.

$$\text{i.e. } G.M. = 20 \log_{10} \frac{1}{|OS|} \text{ dB.}$$