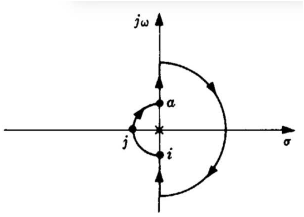
Problem 1 (10 Points) Draw the Nyquist plot of $G(s) = \frac{1}{s}$.

Problem 2 (20 Points) (a) Draw the Nyquist plot of $G(s) = \frac{1}{s(s+1)}$ while excluding the pole at zero. Apply the Nyquist stability criterion to study stability of the unity closed loop system.
(b) Draw the Nyquist plot of $G(s) = \frac{1}{s(s+1)}$ while enclosing the pole at zero as shown in the Figure below. Apply the Nyquist stability criterion to study stability of the unity closed loop system.



Problem 3 (10 Points) Draw the Nyquist plot of $G(s) = \frac{1}{s^2(s+1)}$.

Problem 4 (10 Points) Draw the Nyquist plot of $G(s) = \frac{1}{(s+1)^2}$.

Problem 5 (10 Points) Determine the gain and phase margin for $G = \frac{1}{s}$.