**Nyquist 3: Illustrations of sketching**

Note how initial/final values and trends can be used to form a reasonable sketch.

1. \( \frac{1}{(s + 1)(s + 4)} \)

   - **1<\( w <4 \),** Gain reducing, Phase reducing
   - \( w=0, \ G(jw)=0.25 \)
   - \( w \rightarrow \infty, \ \text{Gain to zero} \)
   - \( \text{Phase to } -180 \)

2. \( \frac{3}{(s + 1)^2 (s + 2)} \)

   - \( w \rightarrow \infty, \ G(jw)=1.5 \)
   - \( w=0, \ \text{Gain to zero} \)
   - \( \text{Phase to } -270 \)
   - Gain reducing, Phase reducing
REMARKS:
1. Trends can be very useful for seeing the impact of different pole/zero positions on the resulting shapes of the Nyquist diagram.
2. This insight is invaluable later!
3. Always a good idea to use MATLAB to check your answers.

NOTE HOW CHANGING ZERO CHANGES TREND HUGELY

\[
G_1 = \frac{9s + 3}{(s + 1)(s + 2)}; \quad G_2 = \frac{2s + 3}{(s + 1)(s + 2)}; \quad G_1 = \frac{0.3s + 3}{(s + 1)(s + 2)}
\]