

Solution to Quiz #11

You were given $G(s) = \frac{1}{s(s+10)(s+100)} = \frac{(1/1000)}{s\left(\frac{s}{10}+1\right)\left(\frac{s}{100}+1\right)}$

The magnitude plot starts at $\omega_{min}=0.1$. The magnitude value there is

$$20\log_{10}\left(\frac{1/1000}{.1}\right) = -40dB \text{ Since there is 1 pole at the origin.}$$

It has an initial slope of -20 dB/decade.

When the graph reaches the first breakpoint (10), the slope becomes -40 dB/decade

When the graph reaches the 2nd breakpoint (100), the slope becomes -60 dB/decade

The phase plot starts at -90 and ends at -270 . A reasonable sketch is shown below. You can easily show that the analytical magnitude response is $-90 - \text{atan}(\omega/10) - \text{atan}(\omega/100)$.

