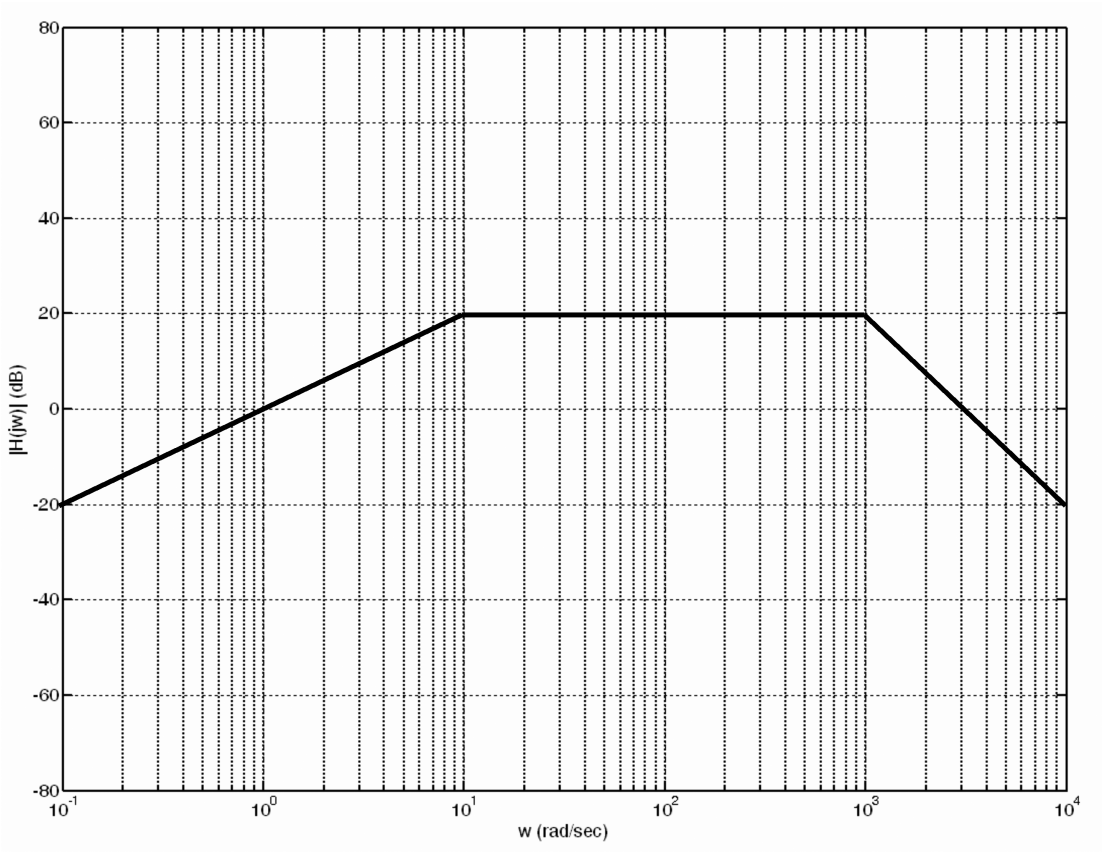
EE322 Fall 2012 Homework Problem Set 33 (PS33)

Be sure to show your work.

1. Given the Bode magnitude plot below, derive a transfer function ($H(j\omega)$) that corresponds to that magnitude plot. Note: if it is hard to read, the frequency axis runs from ω=0.1 rad/sec to $\omega=10^4$ rad/sec, and the magnitude axis runs from -80 dB to +80 dB.



Problem 2 is on the next page.

2. On the semi-log plot on the next page, plot the straight-line Bode magnitude approximation of the following frequency response. Clearly indicate your final plot with a heavy, solid, dark line, and clearly indicate corner frequencies, zeros, poles and slopes of the curve. Label your axes.

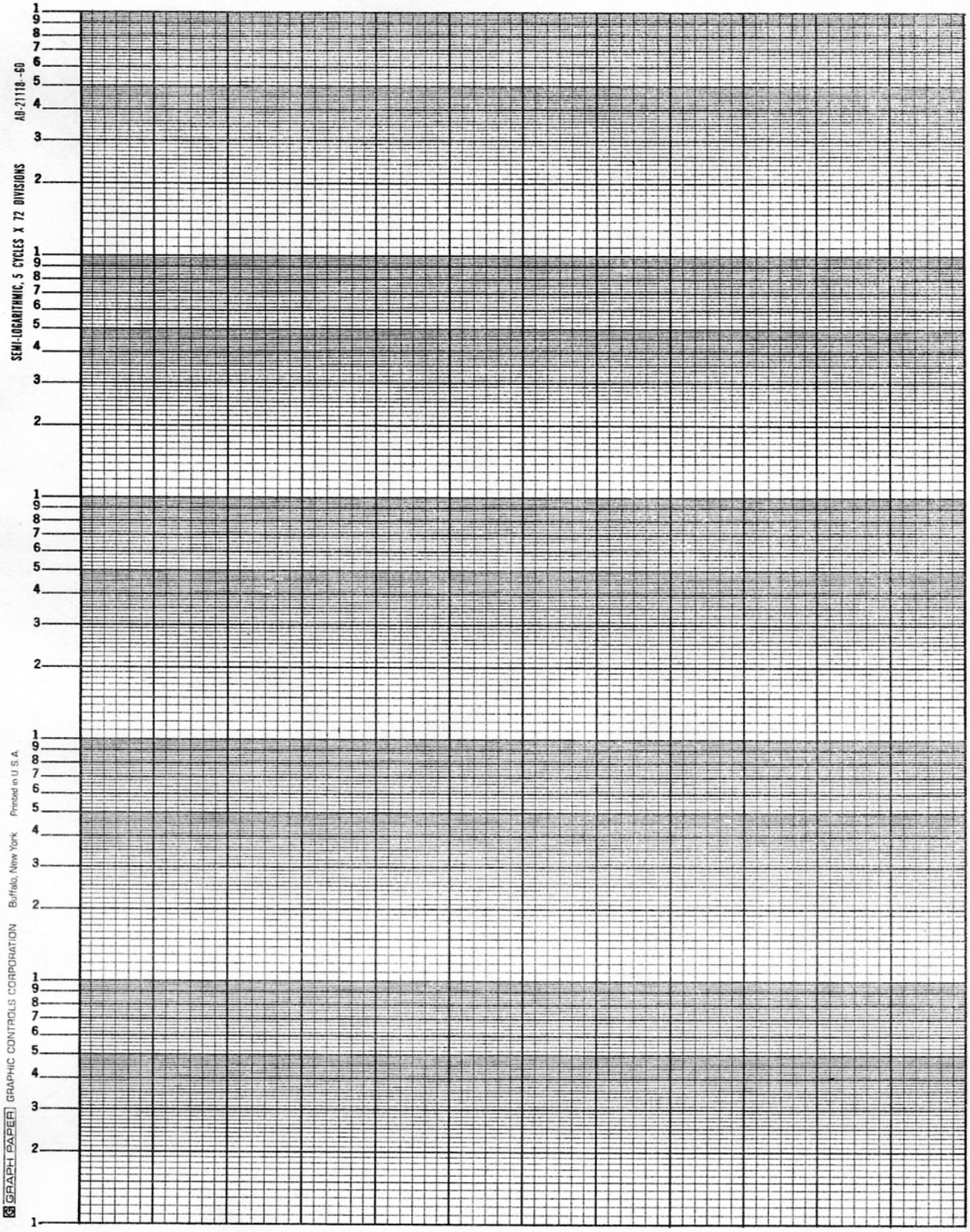
$$H(j\omega) = \frac{9\times 10^3\, j\omega(j\omega + 30)}{(j\omega + 300)^2 (j\omega + 3000)}.$$

What is the frequency independent gain (in dB)?

What are the corner frequencies?

What are the poles and zeros?

What type of filter is this?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