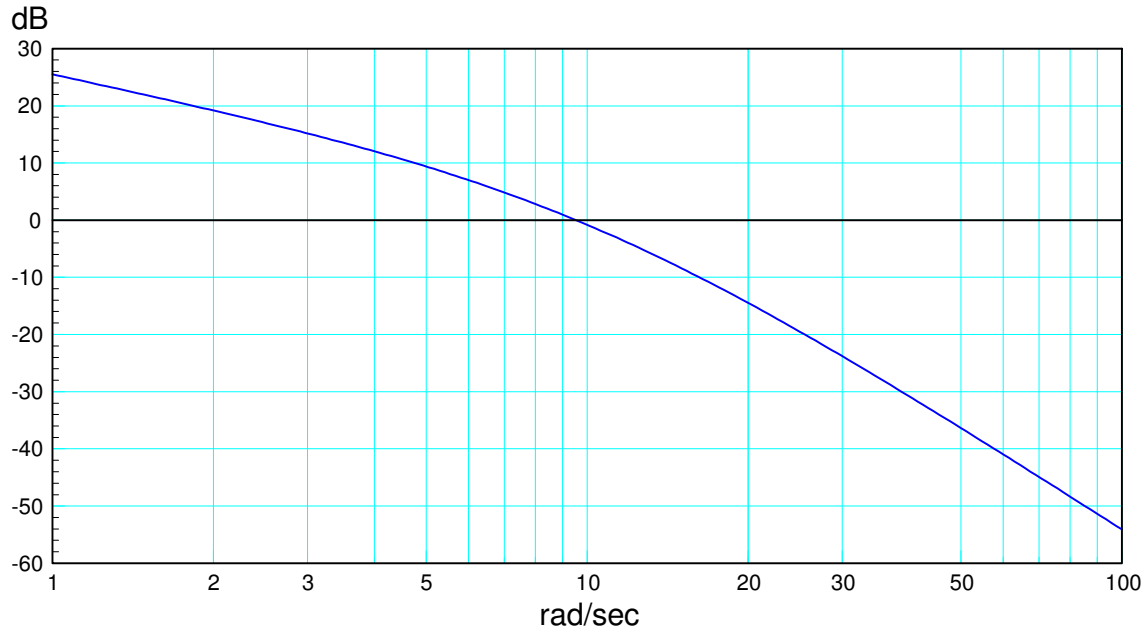
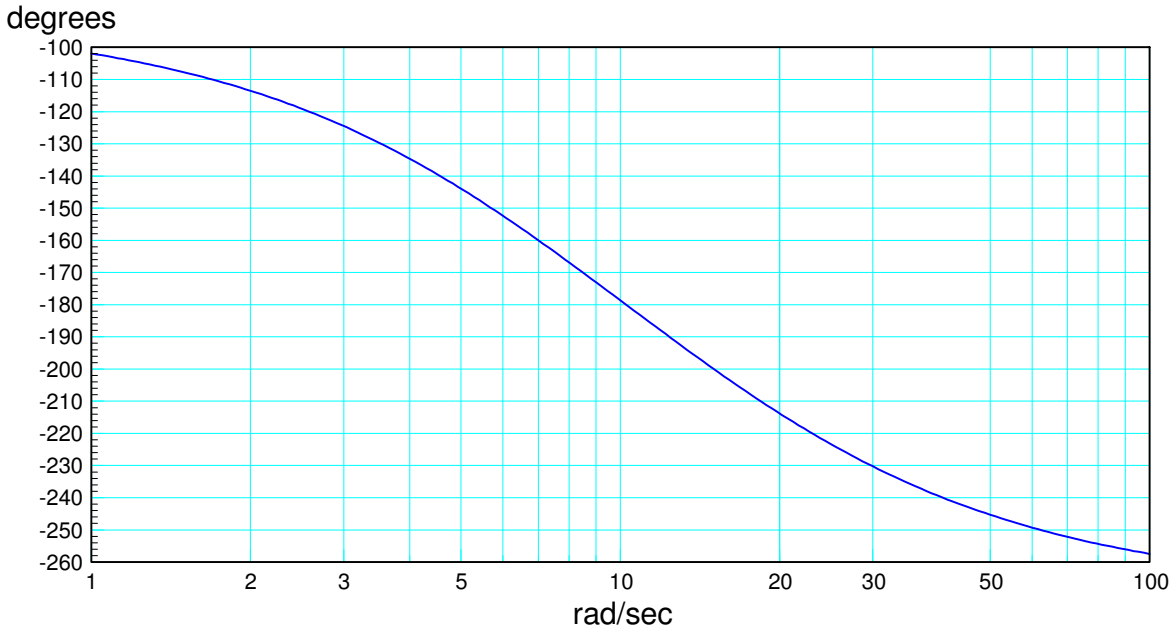
ECE 461/661 Handout #37

Gain & Lead Compensators

1) Design a gain compensator for a 50 degree phase margin

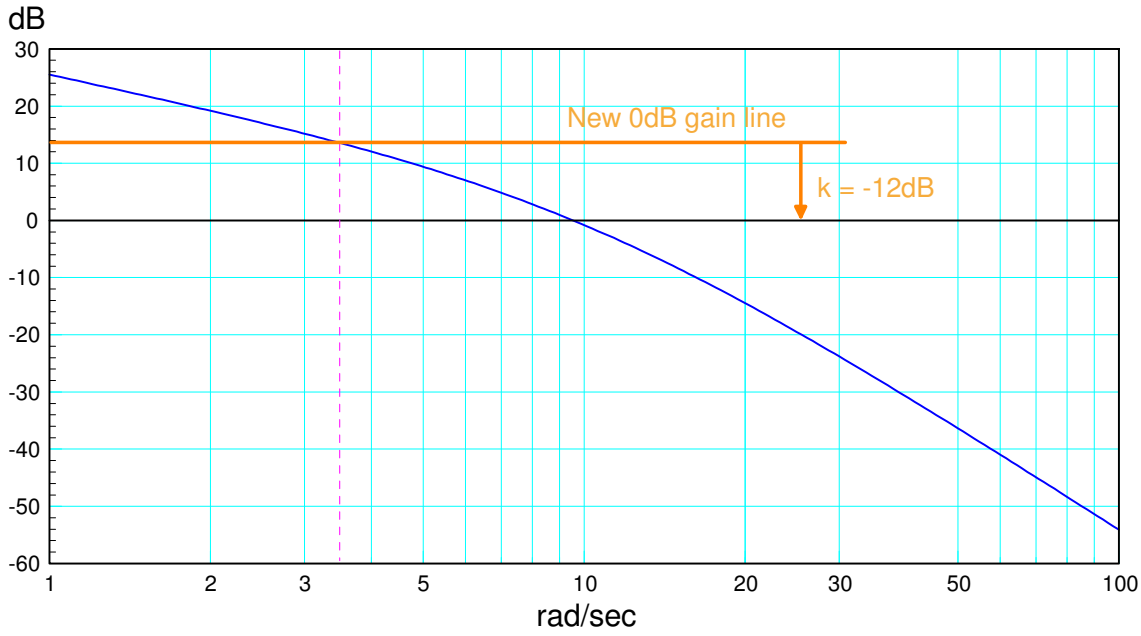
2) Design a lead compensator for a 50 degree phase margin

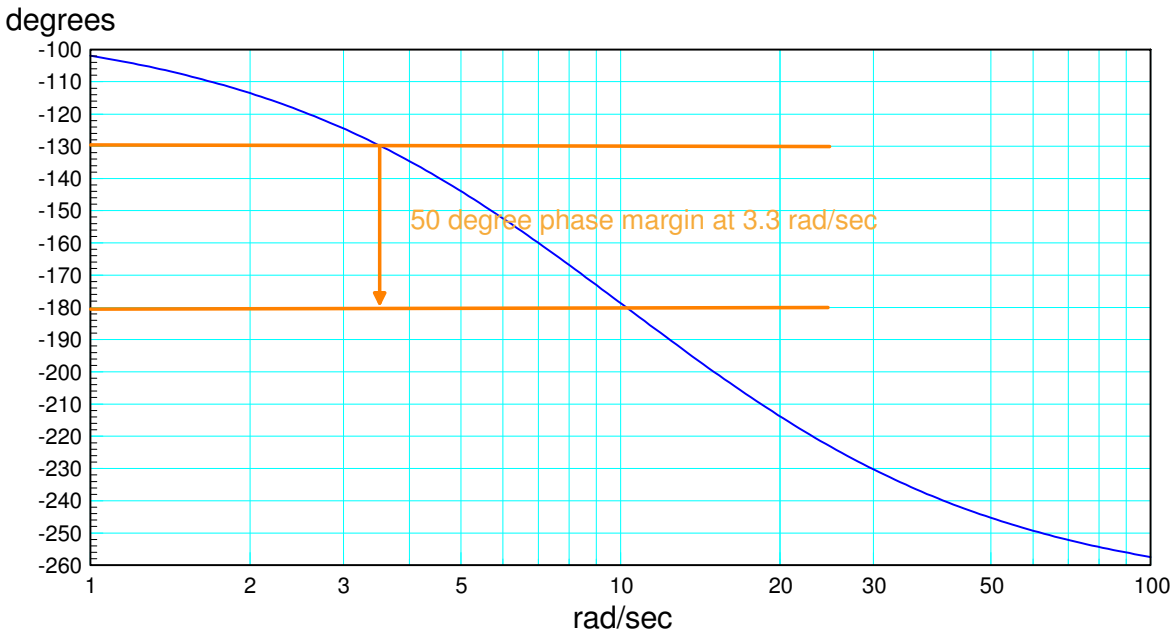




Gain Compensation

1) Design a gain compensator for a 50 degree phase margin
   - Find the frequency where the phase is -130 degrees (50 degrees away from unstable)
   - Make the gain at that frequency equal to 1.000 (0dB)
   - k = -12dB = 0.251





Lead Compensation

2) Design a lead compensator for a 50 degree phase margin

- Determine the frequency which is causing problems (too small phase margin)
- w = 3.3 rad/sec from part #1
- Add a lead compensator to add phase at this freqnecy (zero = (1..3) x 3.3 rad/sec)
- Let $K(s) = 10k\left(\frac{s+5}{s+50}\right)$ k = -4dB = 0.631