

# Conclusions:

- 1) A 2<sup>nd</sup>-order -ve feedback system can never be BIBO unstable. (Closed loop poles never move into RHP).
- 2) As  $A(0)$  (DC gain) increases, damping ( $\sigma = \zeta \omega_n$ ) remains constant.  
 $\rightarrow$  Decay envelope does not change.
- 3) As  $A(0)$  increases,  $\omega_n$  increases.  
 $\rightarrow \zeta = \frac{\sigma}{\omega_n} \dots \zeta$  decreases since  $\sigma = \text{constant}$ .
- 4) As  $A(0)$ , closed loop pole becomes increasingly oscillatory. But its settling time does not change since  $\sigma = \text{constant}$ .

