CHUNG QUANG KHANH — 20245360

✳ **Graph exercise:**

Given $\xi = 0.5$, $\omega_n = 1$, compute t_s, t_p, M_p ?

- $\sigma = \xi \cdot \omega_n = 0.5 \times 1 = 0.5$

- $t_s = \dfrac{4}{\sigma} = \dfrac{4}{0.5} = 8\ (s)$

- $\omega_d = \omega_n \sqrt{1 - \xi^2} = 1 \cdot \sqrt{1 - 0.5^2} \cong 0.866$

- $t_p = \dfrac{\pi}{\omega_d} = \dfrac{\pi}{0.866} \cong 3.627$

- $M_p = \exp\left(-\xi \pi / \sqrt{1 - \xi^2}\right) = \exp\left(-0.5\,\pi / \sqrt{1 - 0.5^2}\right)$

  $\cong 0.163$

Step Response of Second-Order System with $\omega_n = 1$, $\zeta = 0.5$