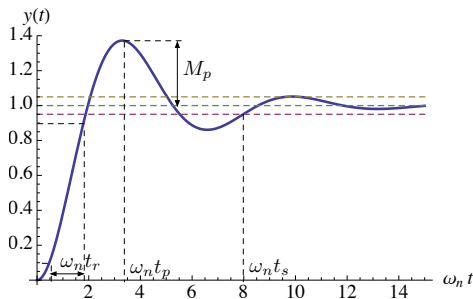


Formulas for TD Specs: Overshoot & Peak Time



We have just computed $t_p = \frac{\pi}{\omega_d}$

To find M_p , plug this value into $y(t)$:

$$\begin{aligned} M_p &= y(t_p) - 1 = -e^{-\frac{\sigma\pi}{\omega_d}} \left(\cos\left(\omega_d \frac{\pi}{\omega_d}\right) + \frac{\sigma}{\omega_d} \sin\left(\omega_d \frac{\pi}{\omega_d}\right) \right) \\ &= \exp\left(-\frac{\sigma\pi}{\omega_d}\right) = \exp\left(-\frac{\pi\zeta}{\sqrt{1-\zeta^2}}\right) \quad \text{— exact formula} \end{aligned}$$