

## Forzante a rampa con limitazione finale

$$m := 10$$

$$k := 4000$$

$$c := 60$$

$$\omega := \sqrt{\frac{k}{m}} = 20$$

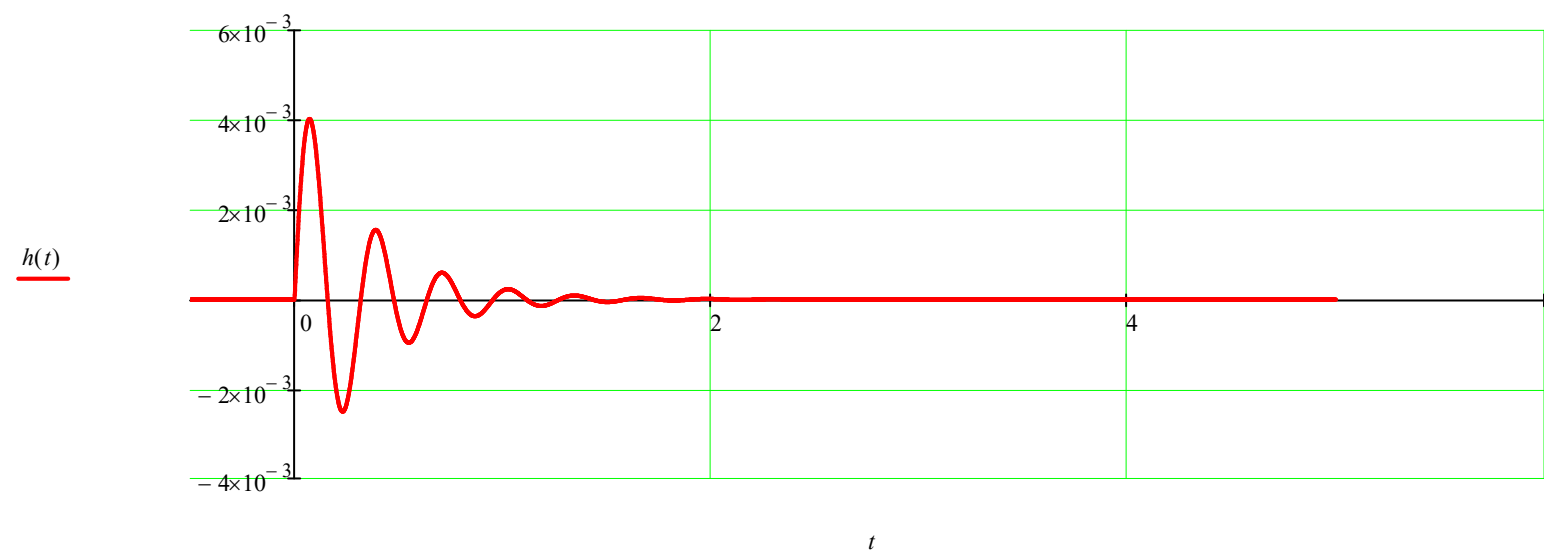
$$\xi := \frac{c}{2 \cdot m \cdot \omega} = 15\%$$

$$\omega_s := \omega \cdot \sqrt{1 - \xi^2} = 19.774$$

## Risposta all'impulso unitario (caso sottosmorzato)

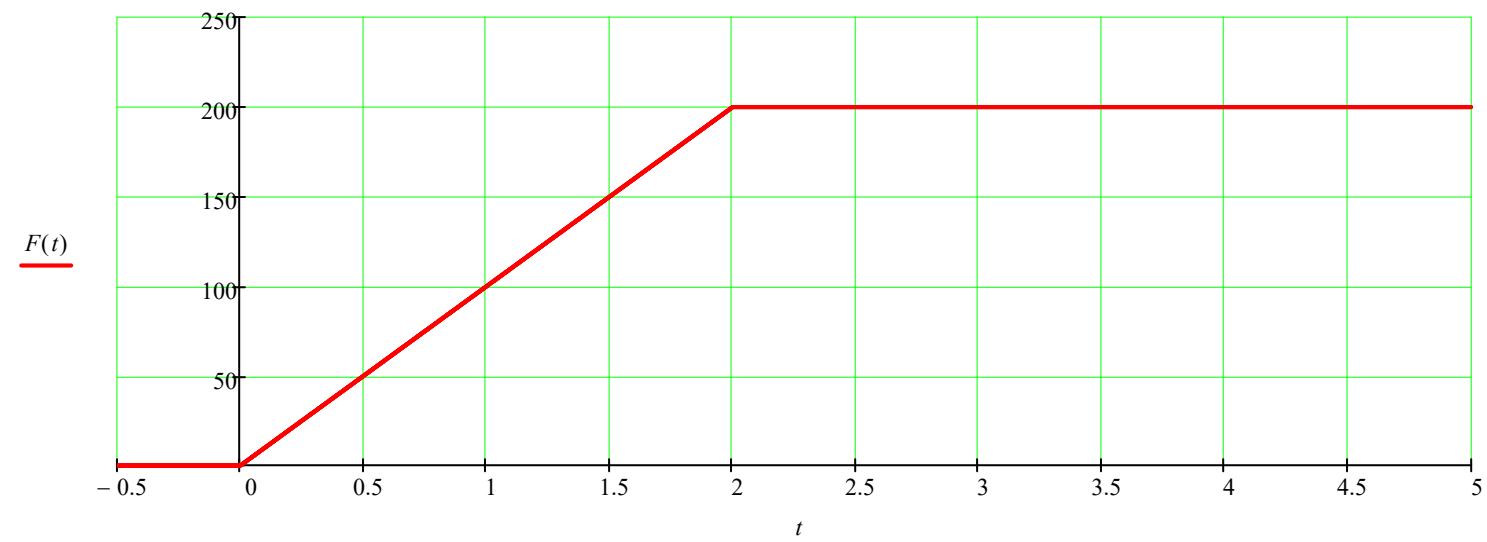
$$h(t) := \begin{cases} 0 & \text{if } t < 0 \\ \frac{e^{-\xi \cdot \omega \cdot t}}{m \cdot \omega_s} \cdot \sin(\omega_s \cdot t) & \text{otherwise} \end{cases}$$

$$t := -0.5, -0.499..5$$



$a := 100$

$$F(t) := \begin{cases} 0 & \text{if } t < 0 \\ a \cdot t & \text{if } 0 \leq t \leq 2 \\ 200 & \text{if } t > 2 \end{cases}$$



Integrale di convoluzione

$$x(t) := \int_0^t F(\tau) \cdot h(t - \tau) d\tau$$

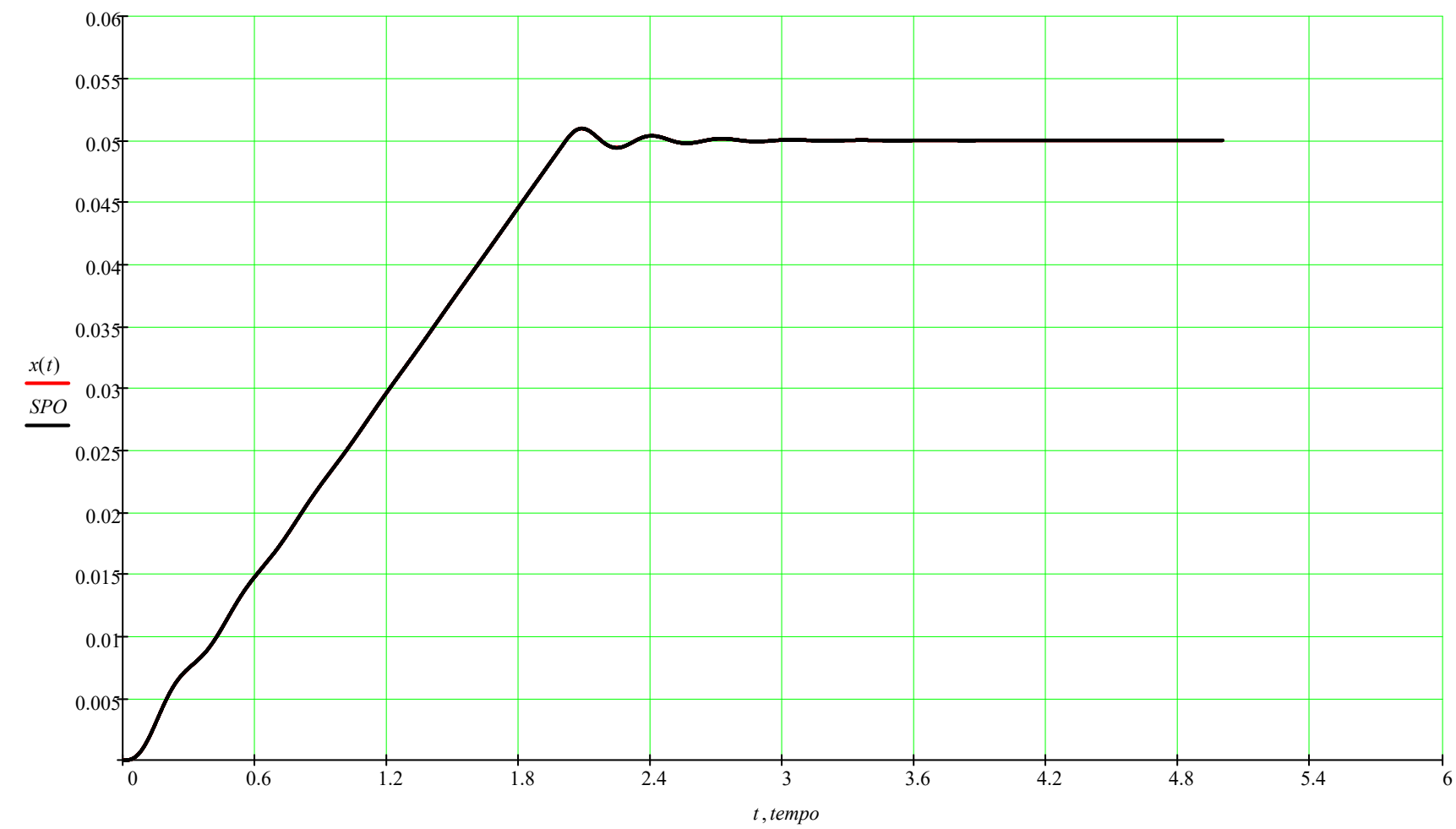
ORIGIN = 1

$$EQMOTO(t, y) := \begin{bmatrix} y_2 \\ \frac{1}{m} \cdot (F(t) - c \cdot y_2 - k \cdot y_1) \end{bmatrix}$$

$$x_0 := 0 \quad v_0 := 0 \quad y := \begin{pmatrix} x_0 \\ v_0 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \end{pmatrix}$$

$TAB := rkfixed(y, 0, 5, 5000, EQMOTO)$

$tempo := TAB^{(1)} \quad SPO := TAB^{(2)}$



— integrale calcolato numericamente  
— Metodo di Runge-Kutta