Linearne dif. enačbe 2. reda

(s konstantnimi koeficienti)

$$ay''+by'+cy=g(x)$$

$$y(x)=C_1y_1(x)+C_2y_2(x)$$

homogena enačba: *g(x)=0*

$$y_{1,2}(x)=e^{r_{1,2}x}$$

$$r_{1,2}=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$

- $r_{1,2}\in\mathfrak{R}$, $r_1\neq r_2$
- $r_{1,2}\in\mathfrak{C}$
- $r_1=r_2$

Linearne dif. enačbe 2. reda

(s konstantnimi koeficienti)

$$ay''+by'+cy=g(x)$$

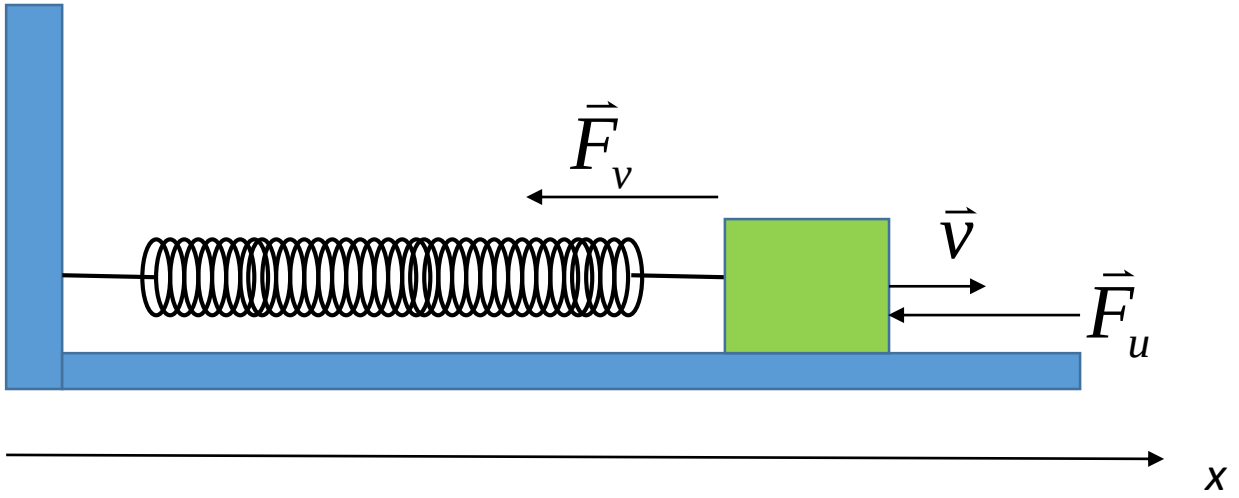
$$y(x)=C_1y_1(x)+C_2y_2(x)$$

homogena enačba: *g(x)=0*

$$y_{1,2}(x)=e^{r_{1,2}x}$$

$$r_{1,2}=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$

- $r_{1,2}\in\mathfrak{R},\ r_1\neq r_2$
- $r_{1,2}\in\mathbb{C}$
- $r_1=r_2$



$$m\ddot{x}+\beta\dot{x}+kx=0$$

$$x(t=0)=0 \quad \dot{x}(t=0)=v_0$$

$$x'(t')=e^{-t'}Sinh\left(t'\sqrt{1-\frac{\omega_0^2}{\beta'^2}}\right)$$

$$x'=x\beta'/v_0 \quad t'=\beta' t$$

$$\beta'=\beta/2m \quad \omega_0^2=k/m$$

Linearne dif. enačbe 2. reda

(s konstantnimi koeficienti)

$$ay''+by'+cy=g(x)$$

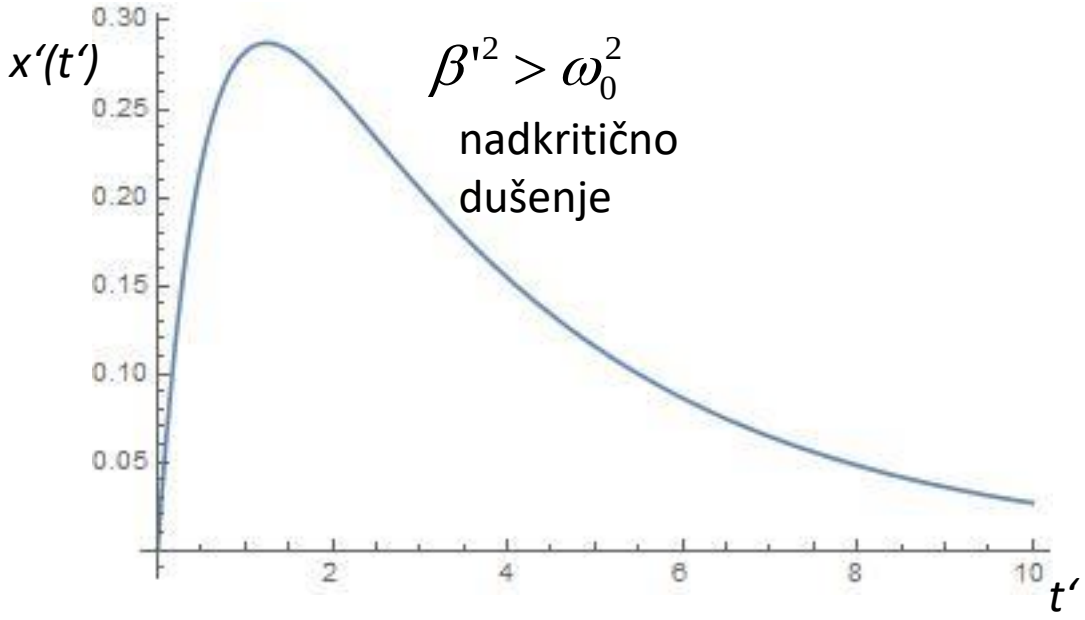
$$y(x)=C_1y_1(x)+C_2y_2(x)$$

homogena enačba: *g(x)=0*

$$y_{1,2}(x)=e^{r_{1,2}x}$$

$$r_{1,2}=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$

- $r_{1,2}\in\mathfrak{R},\ r_1\neq r_2$
- $r_{1,2}\in\mathbb{C}$
- $r_1=r_2$



$\beta'^2>\omega_0^2$

nadkritično dušenje

$$m\ddot{x}+\beta\dot{x}+kx=0$$

$$x(t=0)=0\quad \dot{x}(t=0)=v_0$$

$$x'(t')=e^{-t'}Sinh\left(t'\sqrt{1-\frac{\omega_0^2}{\beta'^2}}\right)$$

$$x'=x\beta'/v_0\quad t'=\beta' t$$

$$\beta'=\beta/2m\quad \omega_0^2=k/m$$

Linearne dif. enačbe 2. reda

(s konstantnimi koeficienti)

$$ay''+by'+cy=g(x)$$

$$y(x)=C_1y_1(x)+C_2y_2(x)$$

homogena enačba: *g(x)=0*

$$y_{1,2}(x)=e^{r_{1,2}x}$$

$$r_{1,2}=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$

- $r_{1,2}\notin\mathfrak{R}$, $r_1\neq r_2$
- $r_{1,2}\notin\mathbb{C}$
- $r_1=r_2$

$$m\ddot{x}+\beta\dot{x}+kx=0$$

$$\beta'=\omega_0 \qquad \omega_1=\omega_2=-\beta'$$

$$x'(t')=e^{-t'}$$

Linearne dif. enačbe 2. reda

(s konstantnimi koeficienti)

$$ay''+by'+cy=g(x)$$

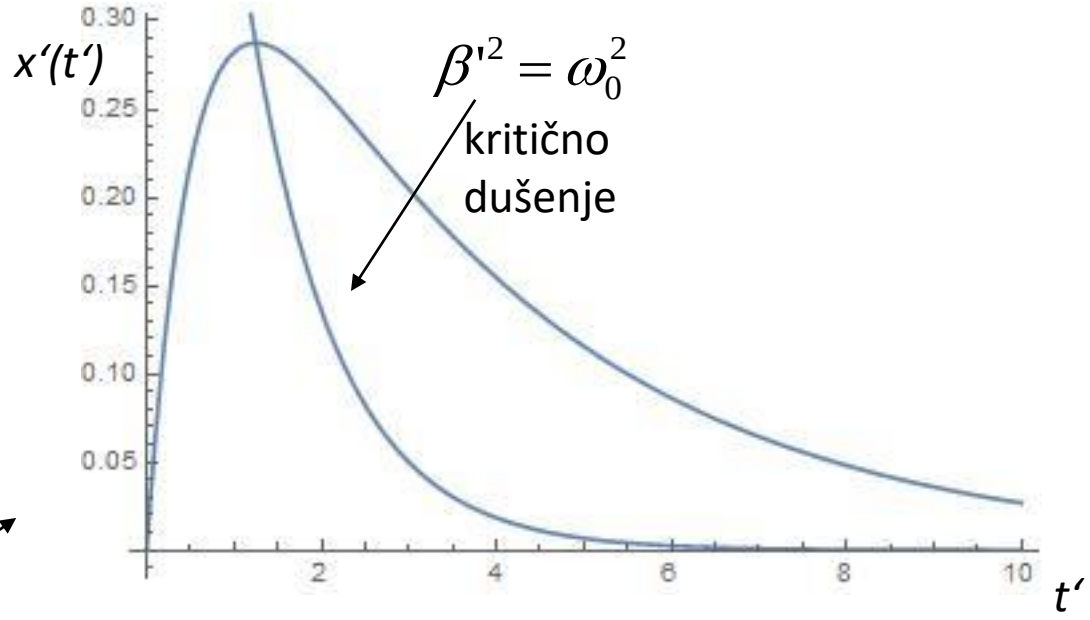
$$y(x)=C_1y_1(x)+C_2y_2(x)$$

homogena enačba: *g(x)=0*

$$y_{1,2}(x)=e^{r_{1,2}x}$$

$$r_{1,2}=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$

- $r_{1,2}\notin\mathfrak{R},\ r_1\neq r_2$
- $r_{1,2}\notin\mathbb{C}$
- $r_1=r_2$



$$m\ddot{x}+\beta\dot{x}+kx=0$$

$$\beta'=\omega_0 \qquad \omega_1=\omega_2=-\beta'$$

$$x'(t')=e^{-t'}$$