- str. 5 prezentace

$$x(t) = e^{\lambda t}$$

$$\dot{x}(t) = \lambda e^{\lambda t}$$

$$\ddot{x}(t) = \lambda^2 e^{\lambda t}$$

↓

dosazení do červeného rámečku:

$$\lambda^2 e^{\lambda t} + 2\delta \lambda e^{\lambda t} + \omega^2 e^{\lambda t} = 0 \;/ : e^{\lambda t}$$

$$\lambda^2 + 2\delta\lambda + \omega^2 = 0 \quad \text{– kvadrat. rovnice}$$

$$D' = b^2 - 4ac:$$

$$D' = 4\delta^2 - 4\omega^2$$

$$\lambda_{1,2} = \frac{-b \pm \sqrt{D'}}{2a} :$$

$$\lambda_{1,2} = \frac{-2\delta \pm \sqrt{4\delta^2 - 4\omega^2}}{2} = -\delta \pm \underbrace{\sqrt{\delta^2 - \omega^2}}_{D} = -\delta \pm D$$

- str. 10 prezentace

$$\tilde{\omega} = \sqrt{\omega_0^2 - \delta^2}, \quad \vartheta = 2\pi \frac{\delta}{\tilde{\omega}} \Rightarrow \delta^2 = \frac{\vartheta^2 \tilde{\omega}^2}{4\pi^2}$$

$$\tilde{\omega}^2 = \omega_0^2 - \delta^2 = \omega_0^2 - \frac{\vartheta^2 \tilde{\omega}^2}{4\pi^2} \Rightarrow \omega_0^2 = \tilde{\omega}^2 \left(1 + \frac{\vartheta^2}{4\pi^2}\right)$$

$$\frac{\omega_0^2}{\tilde{\omega}^2} = 1 + \frac{\vartheta^2}{4\pi^2}$$

$$\frac{\omega_0}{\tilde{\omega}} = \sqrt{1 + \frac{\vartheta^2}{4\pi^2}} \quad \text{cbd.}$$