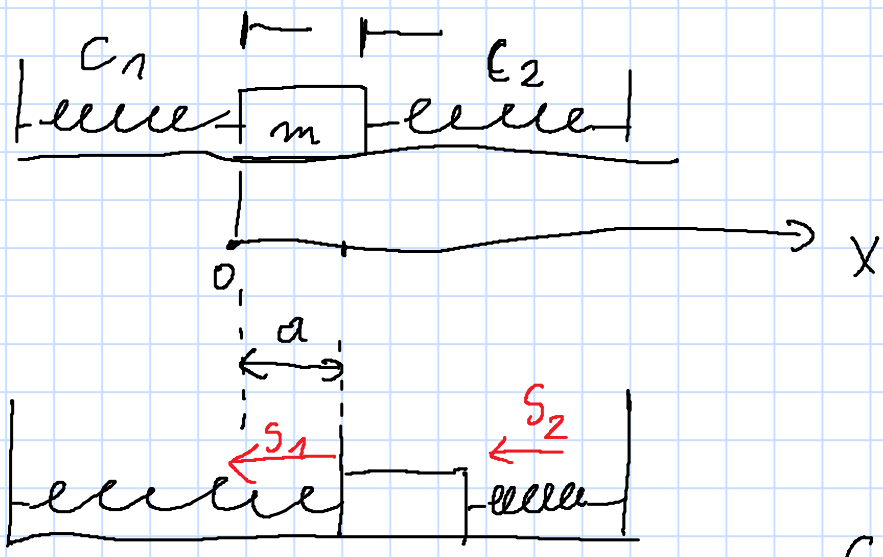

Dane
c_1, c_2, a
m

$$S = c \cdot \Delta l$$

$$m\ddot{x} = \sum F_{ix}$$

$$S_1 = c_1 \cdot x$$

$$S_2 = c_2 \cdot x$$

$$m\ddot{x} = -S_1 - S_2$$

$$m\ddot{x} = -(c_1 + c_2) \cdot x$$

$$\ddot{x} + \frac{c_1 + c_2}{m} x = 0$$

$$r^2 = \ddot{x}$$

$$r = \dot{x}$$

$$r^2 + \frac{c_1 + c_2}{m} = 0$$

$$\Delta = 0^2 - 4\frac{c_1 + c_2}{m} < 0$$

$$r_{1,2} = \pm \sqrt{\frac{c_1 + c_2}{m}}\, i$$

$$\alpha = 0$$

$$x = e^{\alpha t}(A_1 \cos \beta t + A_2 \sin \beta t)$$

$$x = A_1 \cos \sqrt{\frac{c_1 + c_2}{m}} \cdot t + A_2 \sin \sqrt{\frac{c_1 + c_2}{m}} \cdot t$$

dla $t_0 = 0 \quad x_0 = a \quad \dot{x}_0 = 0$

$$a = A_1 + 0 \rightarrow A_1 = a$$

$$\dot{x} = -\sqrt{\frac{c_1 + c_2}{m}} \cdot A_1 \sin \sqrt{\frac{c_1 + c_2}{m}}\, t + \sqrt{\frac{c_1 + c_2}{m}} A_2 \cos \sqrt{\frac{c_1 + c_2}{m}}\, t$$

$$0 = 0 + \sqrt{\frac{c_1 + c_2}{m}} A_2 \rightarrow A_2 = 0$$

$$x = a \cos \sqrt{\frac{c_1 + c_2}{m}} \cdot t$$

ω $\qquad \omega = \frac{2\pi}{T}$

$$T = \frac{2\pi}{\sqrt{\frac{c_1 + c_2}{m}}}$$

$$T = 2\pi \sqrt{\frac{m}{c_1 + c_2}}$$

$$\ddot{x} + \frac{c_1 + c_2}{m} x = 0$$

$\frac{c_1 + c_2}{m} = \omega^2$