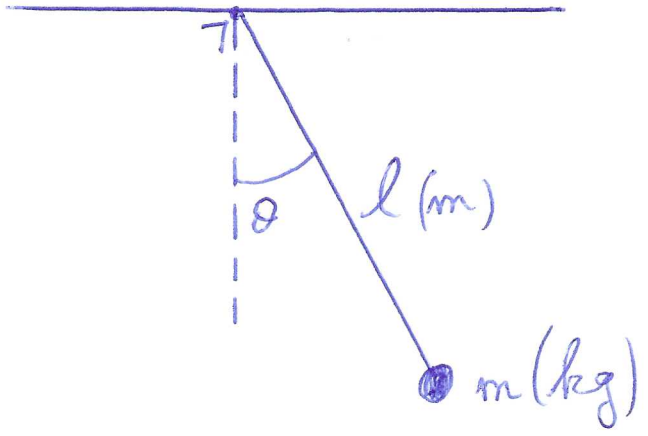

$$\frac{d^2\theta(t)}{dt^2} + \frac{g}{l}\cdot\theta(t) = 0$$

a.) $cSolve\left(n^2 + \frac{g}{l} = 0, n\right) \Rightarrow n_1 = 0 + \sqrt{\frac{g}{l}}\cdot i$

$$n_2 = 0 - \sqrt{\frac{g}{l}}\cdot i$$

$$\theta(t) = \theta_H(t) = C_1\cdot e^{0\cdot t}\cdot\cos\left(\sqrt{\frac{g}{l}}\cdot t\right) + C_2\cdot e^{0\cdot t}\cdot\sin\left(\sqrt{\frac{g}{l}}\cdot t\right)$$

$$= C_1\cdot\cos\left(\sqrt{\frac{g}{l}}\cdot t\right) + C_2\cdot\sin\left(\sqrt{\frac{g}{l}}\cdot t\right)$$

b.) $\theta(t=0) = 0{,}01$; $\frac{d}{dt}(\theta(t))\Big|_{t=0} = 0$

$$solve\left(\begin{cases} 0{,}01 = \theta(0) \\ 0 = \frac{d}{dt}(\theta(t))\Big|_{t=0} \end{cases}, C1, C2\right) \Rightarrow \begin{matrix} C1 = 0{,}01 \\ C2 = 0 \end{matrix}$$

$$\Rightarrow \theta(t) = 0{,}01\cdot\cos\left(\sqrt{\frac{g}{l}}\cdot t\right)$$