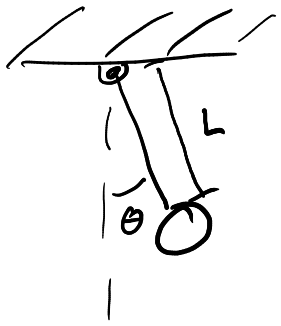
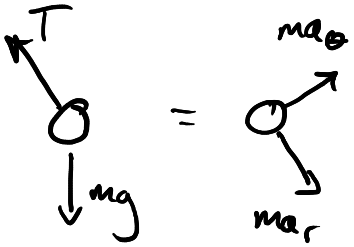


linear

$$\ddot{\theta} = -\frac{g}{L}\theta$$



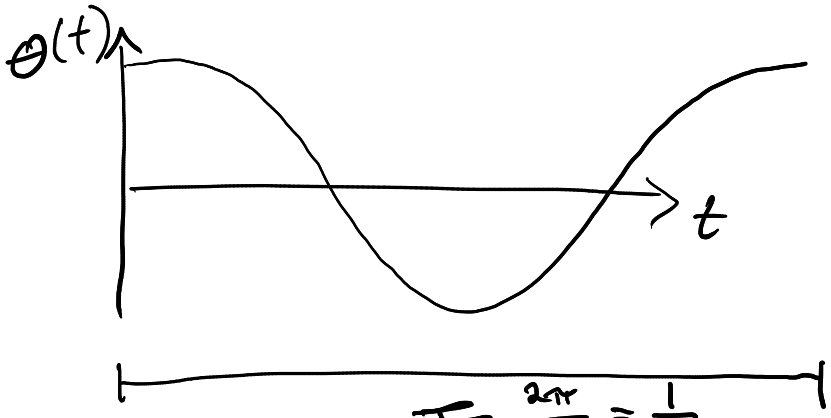
$$\theta(t) = A\cos\omega t$$

$$\omega = \sqrt{\frac{g}{L}}$$

$$\dot{\theta}(t) = -\omega A \sin\omega t$$

$$\ddot{\theta}(t) = -\omega^2 \underbrace{A\cos\omega t}_{\theta(t)}$$

$$\ddot{\theta} = -\omega^2\theta(t) = -\frac{g}{L}\theta(t)$$



$$T = \frac{2\pi}{\omega} = \frac{1}{f}$$

$$T = 2\pi\cdot\sqrt{\frac{L}{g}}$$

	$T = 2\pi\sqrt{\frac{L}{g}}$	$10T =$	error (s)
$L = 1\,m$	1.98 – 2.02 s	9.5, 9.68, 9.48, 11.15	0.07 s – 0.23 s
$L = 2\,m$	2.837 s	14.17, 14.15, 14, 13.66	0.13 s – 0.001 s

$$\frac{T_{2m}}{T_{1m}} = \frac{2\pi}{2\pi} \cdot \sqrt{\frac{g}{g}} \cdot \sqrt{\frac{2}{1}} = \sqrt{2}$$

errors from equ $\rightarrow$ $T = 2\pi\sqrt{\frac{L}{g}}$

$g = 9.81\ m/s^2 \pm 0.005\ m/s^2$

$L = 1m \pm 0.02m$