Dr. Sasha

At first, I would like to thank you for the attachment containing the file answer15.pdf.

It is the citation from your text (answer on task N1)

which implies

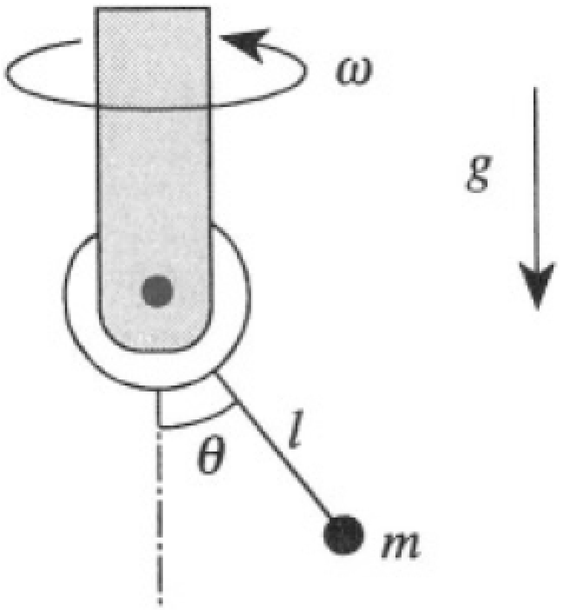
$$\Omega = \sqrt{\left(\omega^2 \cos 2\theta - \frac{g}{l}\cos\theta\right)} = \sqrt{\frac{g^2}{\omega^2 l^2} - 1}.$$

From the expression $\Omega = \sqrt{\frac{g^2}{\omega^2 l^2} - 1}$, the frequency Ω is dimensionless quantity.

Please, give for me a coefficient in front of the square root.

Problem specification

1) The bearing of a rigid pendulum of mass m is forced to rotate uniformly with angular velocity ω (see figure below). The angle between the rotation



axis and the pendulum is called θ. Neglect the inertia of the bearing and of the rod connecting it to the mass. Neglect friction. Include the effects of the uniform force of gravity.

a) Find the differential equation for $\theta(t)$.

b) At what rotation rate ω_c does the stationary point at $\theta = 0$ become unstable?

c) For $\omega > \omega_c$ what is the stable equilibrium value of θ?

d) What is the frequency Ω of small oscillations about this point?