3:

Solve the linearized damped pendulum equation

$$\ddot{\theta} + \frac{b}{m}\dot{\theta} + \frac{g}{L}\theta = 0 \tag{1}$$

By transforming into quadratic form, We have to solve

$$D^2 + \frac{b}{m}D + \frac{g}{L} = 0 \tag{2}$$

where $D = \frac{d}{dt}$. The solutions are

$$D = \frac{-\frac{b}{m} \pm \sqrt{\frac{b^2}{m^2} - 4\frac{g}{L}}}{2} \tag{3}$$

Therefore the solutions for the original equation are

$$\theta = e^{\frac{-b}{2m}t}\left(A_1 e^{\sqrt{\frac{b^2}{4m^2} - \frac{g}{L}}t} + A_2 e^{-\sqrt{\frac{b^2}{4m^2} - \frac{g}{L}}t}\right) \tag{4}$$

Note that

$$\begin{aligned}\frac{-b}{m} + \sqrt{\frac{b^2}{m^2} - 4\frac{g}{L}} &< \frac{-b}{m} + \sqrt{\frac{b^2}{m^2}} \\ &= \frac{-b}{m} + \frac{b}{m} \\ &= 0\end{aligned}$$

If b is great enough, the solution will be a decaying exponential.

Physically saying, the pendulum will stop swinging after a while.

4: