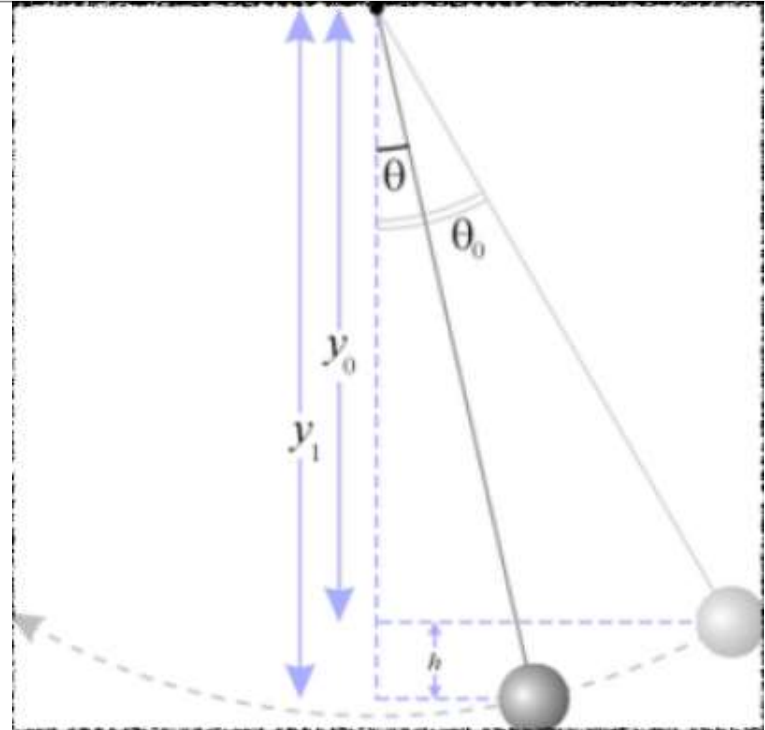


# Activity 7 (damped pendulum)

The evolution of the angle of a damped pendulum,  $\theta(t)$ , is governed by,

$$\frac{d^2\theta}{dt^2} = -\frac{g}{L}\sin\theta - \alpha\frac{d\theta}{dt}$$

where  $g$  is the acceleration due to gravity,  $\alpha$  is the drag, and  $L$  is the length of the pendulum.



- 1) convert this 2<sup>nd</sup> order ODE into two 1<sup>st</sup> order ODEs
- 2) Assuming  $L = 1$  m,  
Plot  $\theta(t)$  for the cases of  $\alpha = 0$ ,  $\alpha = 1$ , and  $\alpha = 10$  all on the same graph.