Problem 1

In this exercise we will be looking at the center of mass of a thin rod of length ℓ and total mass M. The mass is distributed according to a mass per length $\lambda(x)$. See figure 1 below

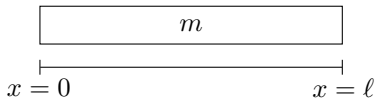

Figure 1: Rod with mass per length

This exercise consists of a total of 4 points.

(1a) 1p Assume in this part problem that $\lambda(x)$ is constant with regards to x (that is uniformly distributed mass). Use the definition of the center of mass to obtain the x coordinate for the center of mass.

(1b) 3p We now have a (still thin) rod that has linear mass distribution ($\lambda(x) = x$). Find the center of mass for this rod.