

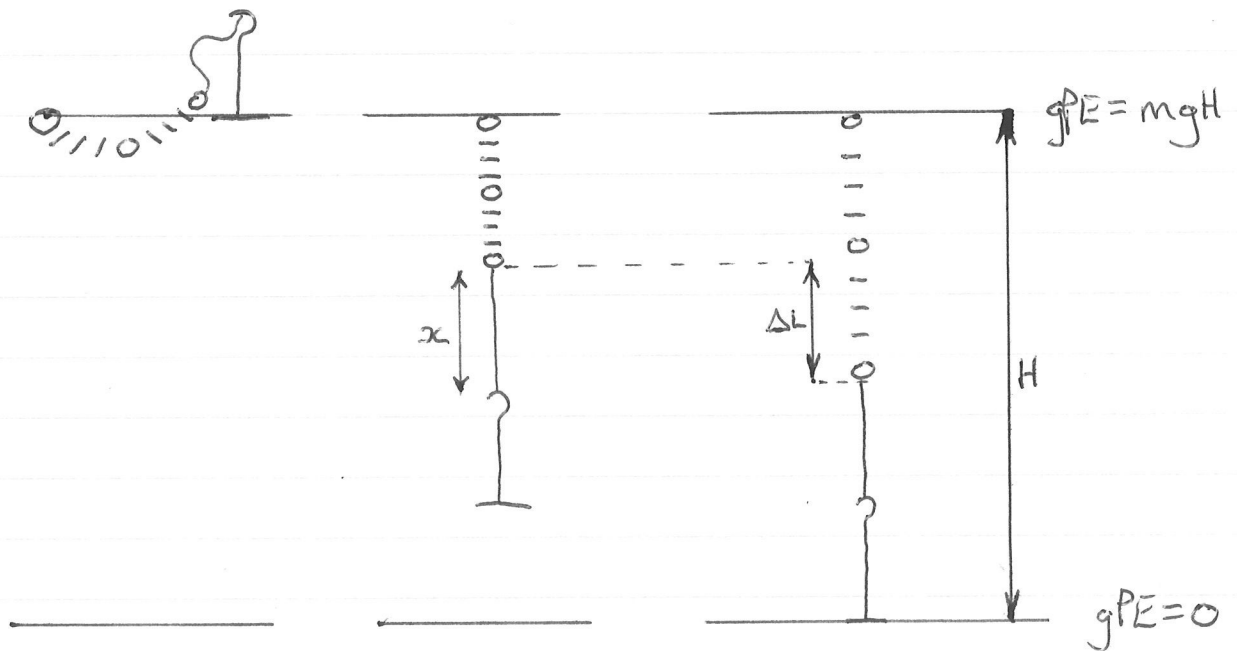
Find  $x$ , the length of string needed between the springs and the mass hanger so that the mass does not hit the floor.

The length of the unstretched springs plus the hanger =  $M$

The length of string =  $x$        $L = x + M$

Drop height above floor =  $H$

Extension when mass reaches lowest point =  $\Delta L$



$$mgH = \frac{1}{2}k(\Delta L)^2$$

$$\Rightarrow \Delta L = \sqrt{\frac{2mgH}{k}}$$

$$x = H - M - \Delta L$$