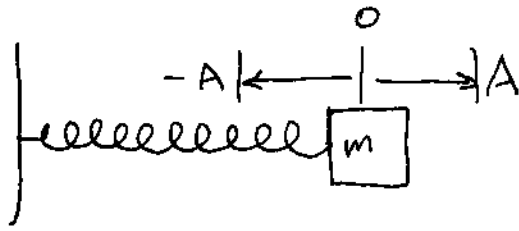


WRITTEN HW WEEK 13 SOLUTIONS



If total mechanical energy is E , then:

$$KE + PE_{\text{elastic}} = E, \text{ constant throughout oscillation.}$$

It's easiest to calculate k, m at $\pm A$ and 0 :

$$E = KE + PE = \frac{1}{2}mv^2 + \frac{1}{2}kx^2$$

At $x = A$, know $v = 0$:

$$E = \frac{1}{2}kA^2 \Rightarrow \boxed{k = \frac{2E}{A^2}}$$

At $x = 0$, know v maximized, equals V :

$$E = \frac{1}{2}mV^2 + \frac{1}{2}kx_0^2 \Rightarrow E = \frac{1}{2}mV^2$$

$$\Rightarrow \boxed{m = \frac{2E}{V^2}}$$