P # E

Ch 13 - Worksheet

a) $x = -8\text{ cm} = -.08\text{ m}$

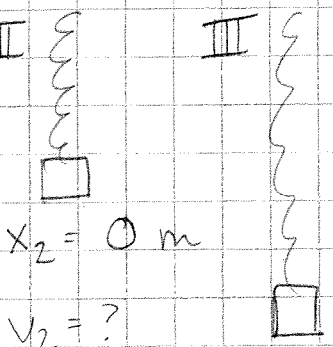
$F = m \cdot g = (.5\text{ kg})(9.8\text{ m/s}^2) = 4.9\text{ N}$

$F = -k \cdot x$

$(4.9\text{ N}) = -k \cdot (-.08\text{ m})$

$\boxed{k = 61.25\text{ N/m}}$

b)



$x_2 = 0\text{ m}$

$v_2 = ?$

$x_3 = .04\text{m}$

$v_3 = 0\text{ m/s}$

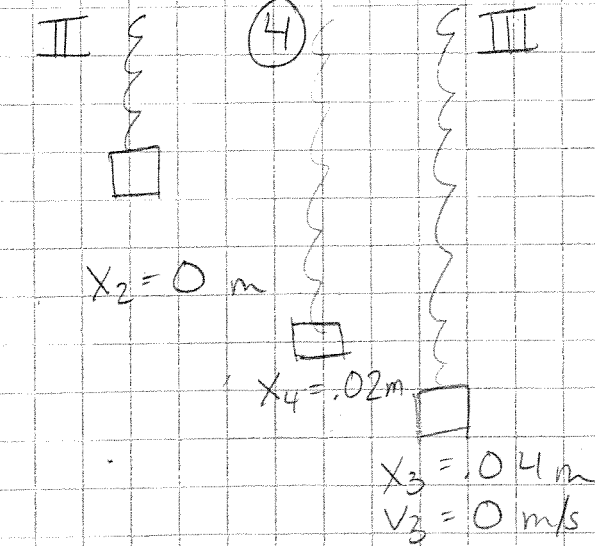
$PE_2 + KE_2 = PE_3 + KE_3$

$\frac{1}{2} \cdot k \cdot x_2^2 + \frac{1}{2} \cdot m \cdot v_2^2 = \frac{1}{2} \cdot k \cdot x_3^2 + \frac{1}{2} m \cdot$

$\frac{1}{2}(.5\text{kg}) \cdot v_2^2 = \frac{1}{2}(61.25\text{N/m})(.04\text{r}$

$\boxed{v_2 = .44\text{ m/s}}$

c)



$x_2 = 0\text{ m}$

$x_4 = .02\text{m}$

$x_3 = .04\text{m}$

$v_3 = 0\text{ m/s}$

$PE_4 + KE_4 = PE_3 + KE_3$

$\frac{1}{2} \cdot k \cdot x_4^2 + KE_4 = \frac{1}{2} \cdot k \cdot x_3^2 + \frac{1}{2}$

$\frac{1}{2}(61.25\text{N/m})(.02\text{m})^2 + KE_4 = \frac{1}{2}(61.25\text{N}$

$(.04$

$\boxed{KE_4 = .037\text{ J}}$