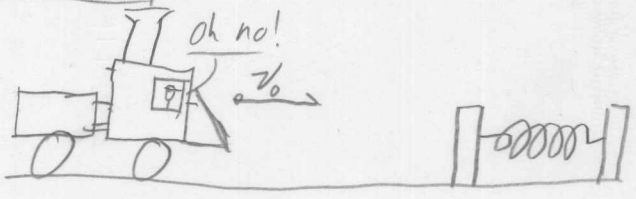
Physics 111
Homework

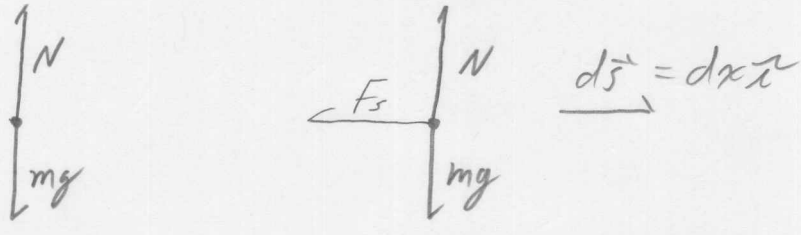
Ch 7-23



$M = 2300\ kg$

$v_0 = 7.5\ m/s$

$k = 2.8\ MN/m$



Initial Final

$U_I = 0$ $\quad U_F = \frac{1}{2}kd^2$

$K_I = \frac{1}{2}mv_0^2$ $\quad K_F = 0$

NCF

$W_N = \int \vec{N}\cdot d\vec{s} = 0,\ \vec{N} \perp d\vec{s}$

$W_g = \int m\vec{g}\cdot d\vec{s} = 0,\ \vec{g} \perp d\vec{s}$

Conservation of Energy

$U_I + K_I + W_{NCF} = U_F + K_F$

$\frac{1}{2}mv_0^2 = \frac{1}{2}kd^2$

$$d = \left(\frac{mv_0^2}{k}\right)^{1/2} = \left(\frac{(2300)(7.5)^2}{2.8\times 10^6}\right)^{1/2} = 0.21\ m$$