



Ex 13.4
p397

-x



$m = 1.6 \text{ kg}$
 $k = 1 \times 10^3 \frac{\text{N}}{\text{m}}$
 $x = 2 \text{ cm}$
 $= .02 \text{ m}$
 $v_i = 0$

a) $v = ?$, $x = 0$

$$\frac{1}{2} m v_i^2 + \frac{1}{2} k x_i^2 = \frac{1}{2} m v_f^2 + \frac{1}{2} k x_f^2$$

$$\sqrt{\frac{k x_i^2}{m}} = v_f$$

$$\sqrt{\frac{1 \times 10^3 (.02)^2}{1.6}} = v_f$$

$$.5 \frac{\text{m}}{\text{s}} = v_f$$

at equil. $x = 0$

no PE_g mgh all horiz. motion

$$PE_{gi} = PE_{gf}$$

* this is when you ignore F_f

$W_f = F_f \cdot d$ $d = .02 \text{ m}$
 $F_f = 4 \text{ N}$

$$-F_f \cdot d = \frac{1}{2} m v_f^2 - \frac{1}{2} k x_i^2$$

$$-4(.02) = \frac{1}{2}(1.6)v_f^2 - \frac{1}{2}(1 \times 10^3)(.02)^2$$

W_f - slow block down
 F_f takes away from system

$$-.08 = .8 v_f^2 - .2$$

$$-.08 + .2 = .8 v_f^2$$

$$\sqrt{\frac{.12}{.8}} = v_f$$

$$.4 \frac{\text{m}}{\text{s}} = v_f$$

HW 10, 14a, b