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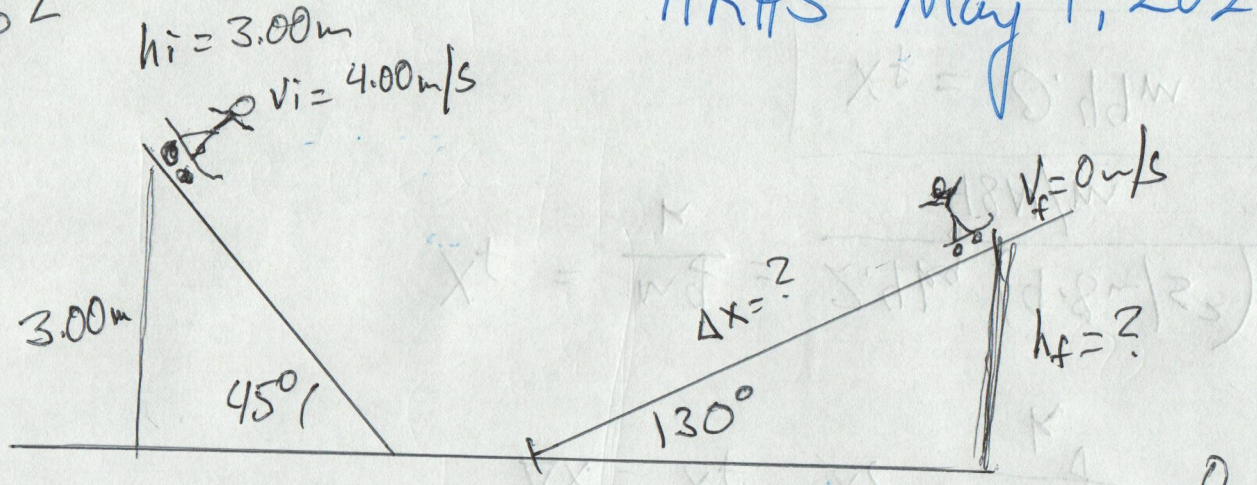
11.

HRHS May 4, 2020



SOH

$$\sin 30° = \frac{h_f}{\Delta x}$$

$$\Delta x = \frac{h_f}{\sin 30°}$$

$$\frac{1}{2}mv_i^2 + mgh_i = \frac{1}{2}mv_f^2 + mgh_f + E_{th}$$

($v_f = 0$, $E_{th} = 0$)

$$\frac{1}{2}v_i^2 + gh_i = gh_f$$

$$h_f = \frac{v_i^2}{2g} + h_i = \frac{(4.00\,m/s)^2}{2(9.8\,m/s^2)} + 3.00\,m$$

$$h_f = 3.8163\,m$$

$$\Delta x = \frac{3.8163\,m}{\sin 30°}$$

$$\boxed{\Delta x = 7.63\,m}$$

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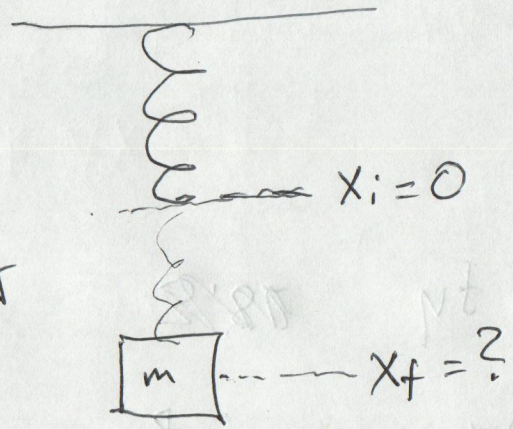
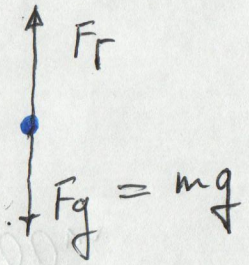
15. (modified)



$m = 2.4\,kg$

$k = 48\,N/m$

$F_r = k\Delta x$



$F_R = F_g = ma = 0$

$F_r = F_g = mg$

$F_r = mg$

$k\Delta x = mg$

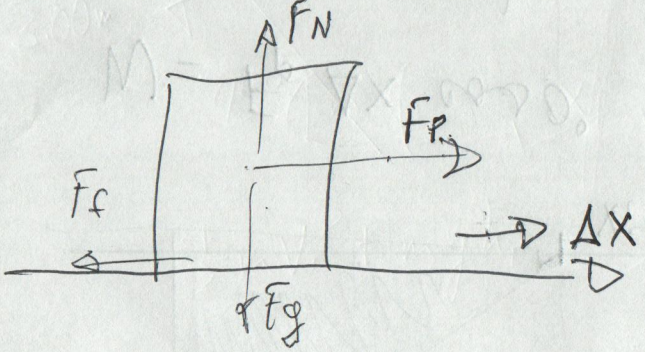
$\Delta x = x_f - x_i = \frac{mg}{k}$

$x_f = \frac{mg}{k} = \frac{2.4\,kg\,(9.8\,m/s^2)}{48\,N/m} = 0.49\,m$

$\boxed{x_f = 0.49\,m}$

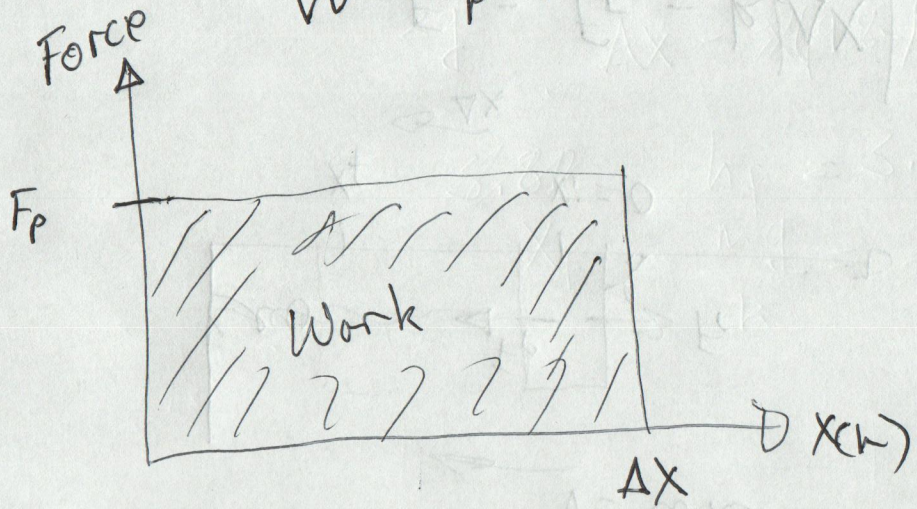
Ch. 17.2

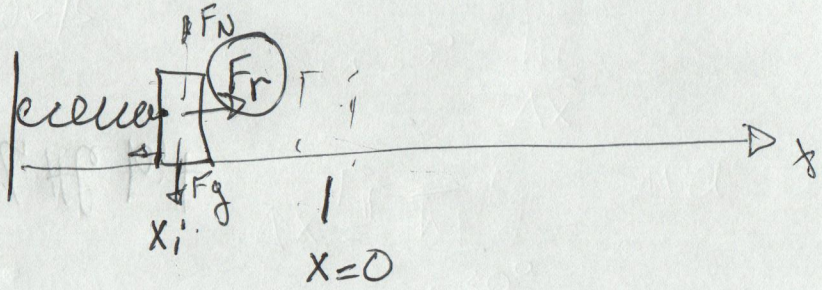
$W = F \cdot \Delta x \cos\theta$



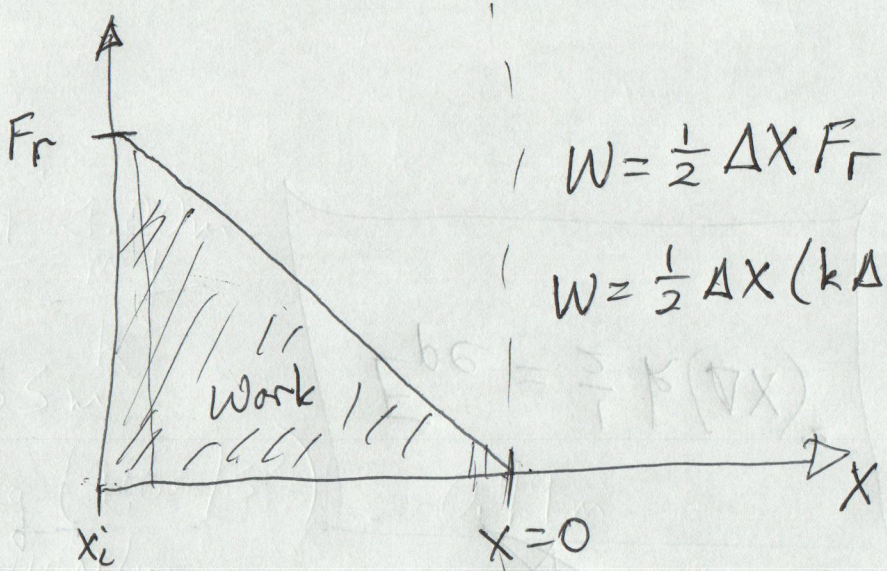
$W = F_p \cdot \Delta x \cos 0°$

$W = F_p \cdot \Delta x$





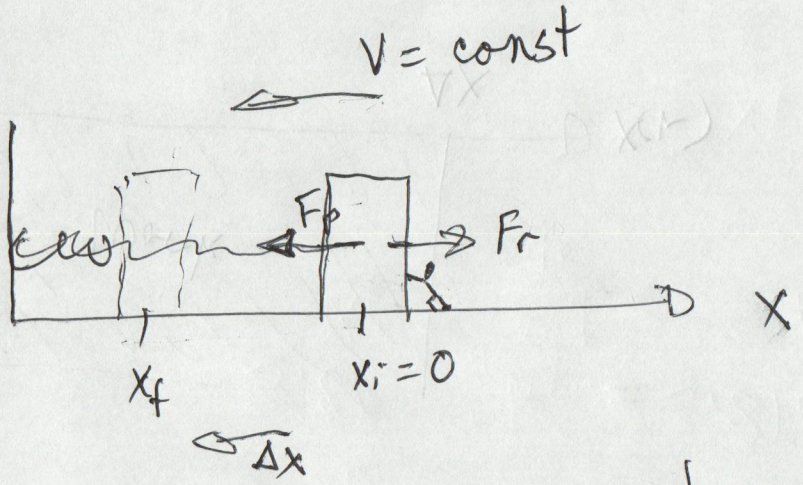
$F_r = -k \Delta x$



$W = \frac{1}{2} \Delta x F_r$

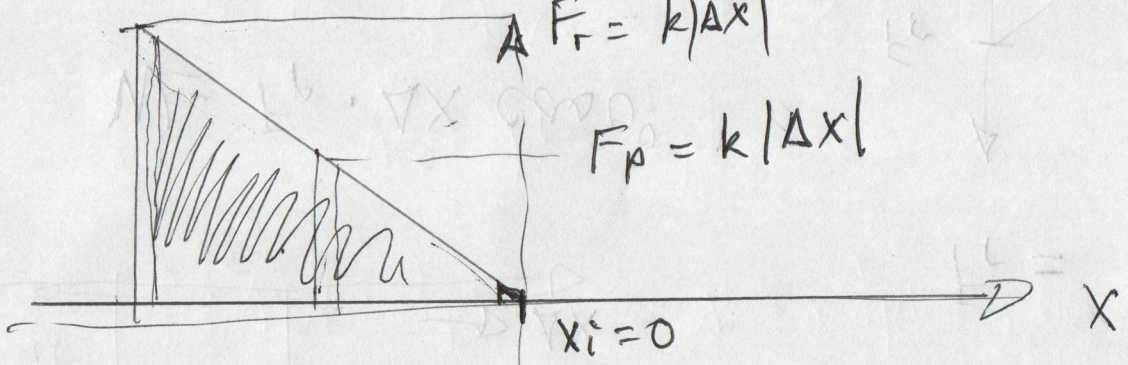
$W = \frac{1}{2} \Delta x (k \Delta x)$

$W = \frac{1}{2} k \Delta x^2$



$$E_{pe} = \frac{1}{2} k(\Delta X)^2$$

$$F_p = F_r = k|\Delta X|$$



$$W = F_p \Delta X \cos 0^\circ$$

$$W = F_p |\Delta X| = F_r \cdot |\Delta X|$$ 1st little bit

$$W = \frac{1}{2} |k \Delta X| \Delta X$$

$$W = \frac{1}{2} k \Delta X^2$$