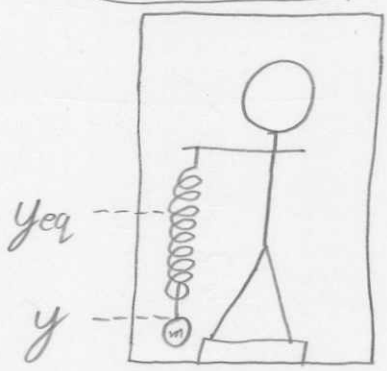
Ch 4, #65



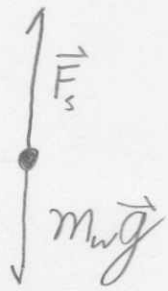
$m_p = 65\,kg$

$m_w = 5\,kg$

$k = 1.08\ kN/m = 1.08\times10^3\ N/m$

$y - y_{eq} = -5\,\text{cm} \cdot \frac{1}{100}\frac{m}{\text{cm}} = -0.05\,m$

a)



Free body diagram
For the weight

$F_s - m_w g = m_w a$

let $y_{eq} = 0$, $F_s = -ky$

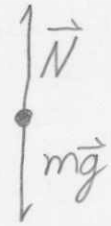
$-ky - m_w g = m_w a$

$$\Rightarrow \boxed{a = -\frac{ky}{m_w} - g}$$

$$a = -\frac{(-0.05)(1.08\times10^3)}{5} - 9.8$$

$\boxed{a = 1.0\ m/s^2}$ acceleration up ↑a

b)



Free body diagram
For the person

$N - m_p g = m_p a$

$$\Rightarrow \boxed{N = m_p(a+g)}$$

$N = 65(1.0 + 9.8) = \boxed{75\,N}$