HW5-4 Soln)

Let up be positive. Then, much like the elevator problem,

$$+F_N - gm = ma$$

$$+F_N = gm + ma$$

Let's find the acceleration:

y_i = 0 m

y_f = +1.5 m

v_{yi} = 0 m/s

v_{yf} = +4.5 m/s

a_y = ? ←

t = ?

(4)

$$v_{yf}^2 = v_{yi}^2 + 2a_y(y - y_i)$$

$$a_y = \frac{v_{yf}^2 - v_{yi}^2}{2(y - y_i)} = \frac{4.5^2 - 0^2}{2(1.5 - 0)} = +6.75\ m/s^2$$

Then,

$$+F_N = gm + ma = 10(0.19) + (0.19)(6.75) = 3.18\ N$$