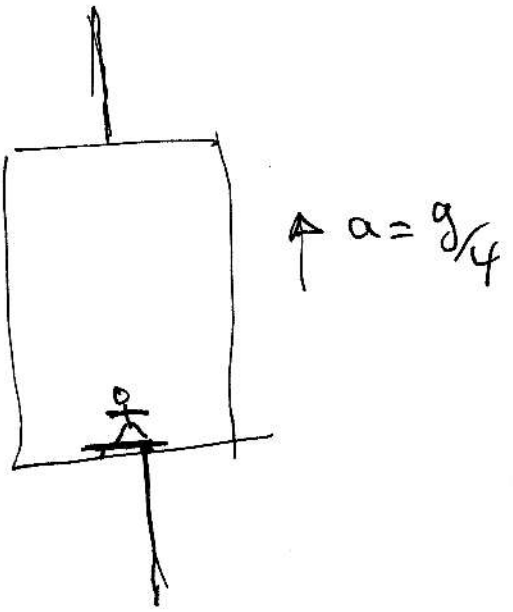
5-1

$mg = 120\ lb$



a)

Elevator's frame of reference:

- Person is at rest

$$F'_{net} = 0 \rightarrow$$

$$-mg + N - m(g/4) = 0$$

$$\boxed{N = 5/4\ mg} = 150\ lb$$

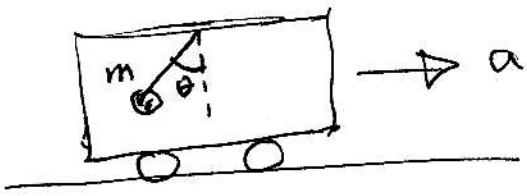
b)

$$F'_{net} = 0$$

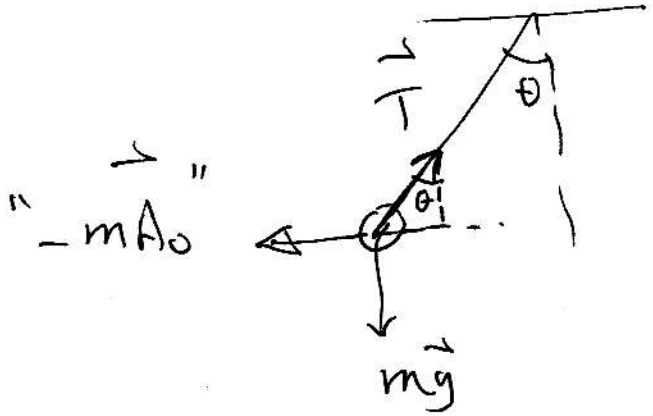
$$-mg + N + m(g/4) = 0$$

$$\boxed{N = 3/4\ mg} = 90\ lb$$

5.3



$T = ?$ $\theta = ?$



$$\vec{F}'_{net} = 0$$

$$\vec{T} + m\vec{g} - m\vec{A}^{0} = 0$$

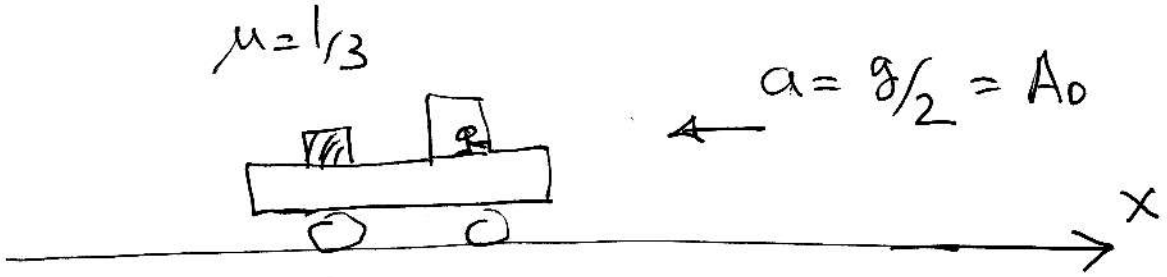
x: $T \sin\theta = m(g/10)$

y: $T \cos\theta = mg$

$\tan\theta = \frac{1}{10} \rightarrow \boxed{\theta = 5.7^{\circ}}$

$\boxed{T = 1.00\ mg}$

5.5



Noninertial System:

$$\sum \vec{F}' = m\vec{a}'$$

$$\vec{F} - m\vec{A}_0 = m\vec{a}'$$

$$-\mu_s m g + m(g/2) = m a'$$

$$a' = -\tfrac{1}{3} g + g/2 = \boxed{\frac{g}{6}} \quad \text{to the right}$$

$$a = \vec{a}' + \vec{A}_0$$

$$a = \frac{g}{6} - g/2 = \boxed{-\tfrac{1}{3} g} \quad \text{to the left}$$