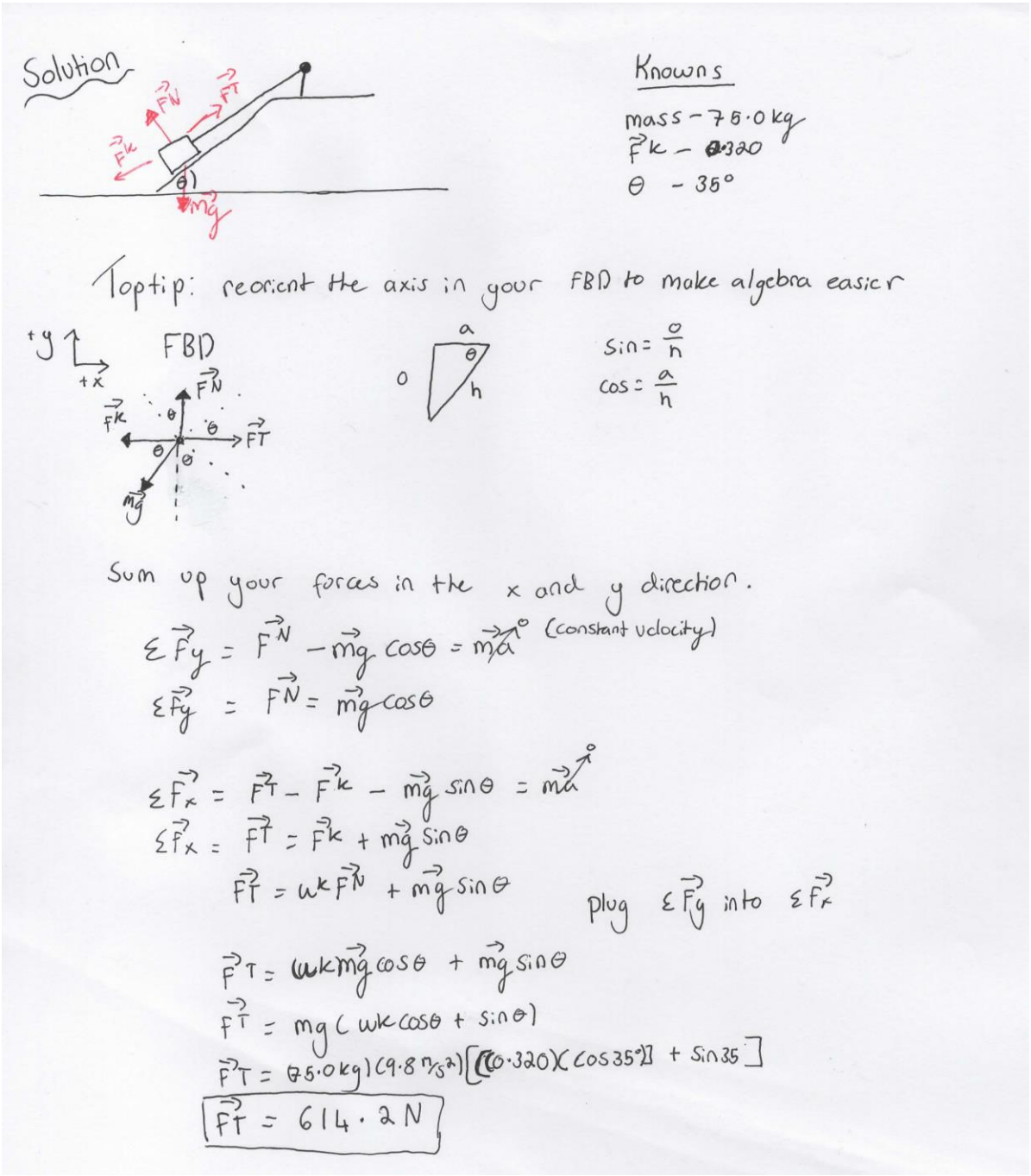
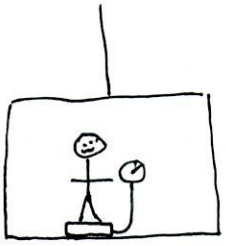
Q101

A crate is pulled up a slope at a constant velocity by a tow bar. The slope is inclined at 35° with respect to the horizontal. The force applied to the crate by the tow bar is parallel to the slope. The crate's mass is 75.0 kg, and the coefficient of kinetic friction between the crate and the snow is 0.320. Find the magnitude of the force that the tow bar exerts on the box.



An 85.0 kg person stands on a scale in an elevator. What is the apparent weight when the elevator is (a) accelerating downward with an acceleration of 1.23 m/s², (b) moving upward at a constant speed, and (c) accelerating upward with an acceleration of 1.50 m/s²?



a)

$$\Sigma \vec{F}_y = m\vec{a}_y$$

$$F^N = (85\,kg)(9.8\,m/s^2 - 1.23\,m/s^2)$$

$$F^N = 728.45\,N$$

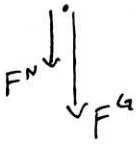
b)

$$\Sigma \vec{F}_y = m\vec{a}_y$$

$$F^N = (85\,kg)(9.8\,m/s^2)$$

$$F^N = 833\,N$$

c)



$$\Sigma \vec{F}_y = m\vec{a}_y$$

$$F^N = (85\,kg)(9.8\,m/s^2 + 1.5\,m/s^2)$$

$$F^N = 960.5\,N$$