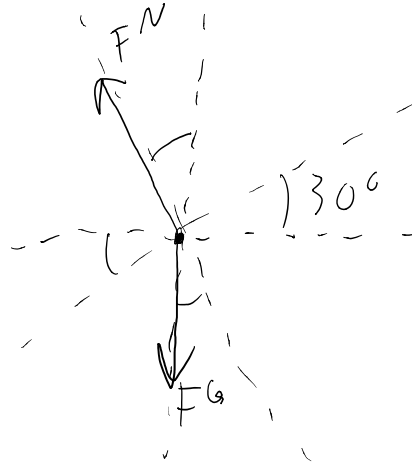
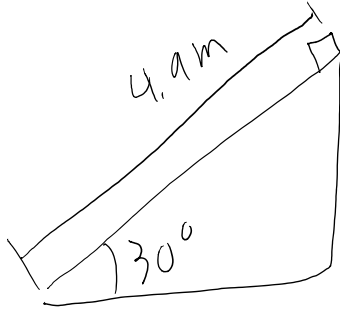


A 14 kg block rest at the top of a frictionless ramp the is 4.9 m long and 30 degrees above the horizontal. How long will it take the block to slide to the bottom?



$$\sum F_x = m a_x$$

$$F_x^G = m a_x$$

$$F^G \sin \theta = m a_x$$

~~$$m g \sin \theta = m a_x$$~~

$$g \sin \theta = a_x$$

$$9.8 \cdot \sin 30^\circ \frac{m}{s^2} = a_x$$

K

$$a_x = 4.9 \frac{m}{s^2}$$

$$\Delta x = 4.9 m$$

$$V_i = 0 \frac{m}{s}$$

U

V_f

Δt

$$\Delta x = V_i \Delta t + \frac{1}{2} a \Delta t^2$$

$$V_f = V_i + a \Delta t$$

$$V_f^2 = V_i^2 + 2 a \Delta x$$

$$4.9 = 0 \cdot \Delta t + \frac{1}{2} (4.9) \Delta t^2$$

$$4.9 = \frac{1}{2} \cdot 4.9 \cdot \Delta t^2$$

$$2 = \Delta t^2$$

$$1.41 \text{ s} = \Delta t$$