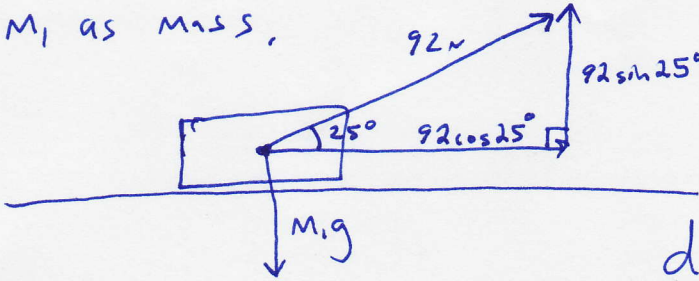


5

1. A student is pulling a sled across level snow covered ground applying a force of 92 N, at an angle of 25° above the horizontal. Suppose the snow is essentially friction free and the sled is initially motionless. Find the acceleration of the sled, and find the displacement of the sled over a time period of 5 seconds provided the conditions do not change.

USE M_1 AS MASS.



$$\sum F_x = Ma$$

$$\sum F_x = 92 \cos 25^\circ = M_1 a$$

$$\frac{92 \cos 25^\circ}{M_1} = a$$

$$d = v_i t + \frac{1}{2} a t^2$$

$$d = \frac{1}{2} \cdot \frac{92 \cos 25^\circ}{M_1} (5 \text{ sec})^2$$

$$d = \frac{1042 \text{ N}}{M_1} \quad \text{Is just as good}$$

5

2. Suppose a 2400g cart is pulled across a lab table by a 600 g mass, set up as shown at the right below. Find the acceleration of the cart. Also, find the time required for the cart to roll 0.5 m starting from rest.

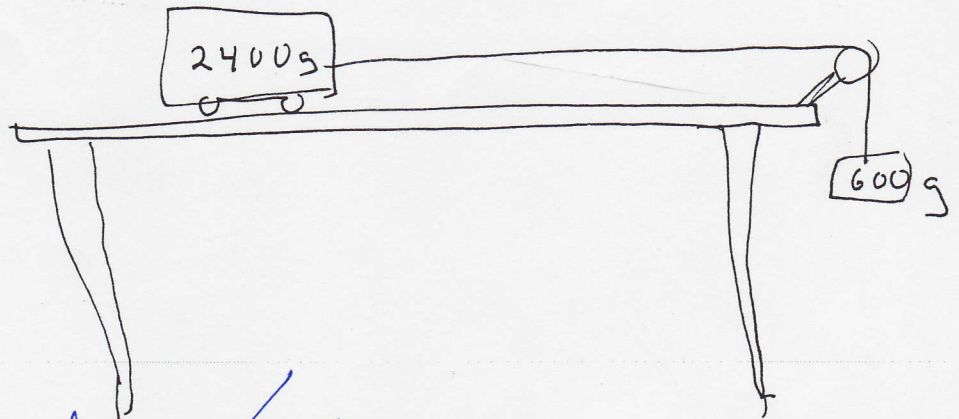
For the system.

$$\sum F = ma$$

$$\frac{\sum F}{m} = a$$

$$\frac{6 \text{ N}}{3 \text{ kg}} = a$$

$$\boxed{\frac{2 \text{ m}}{\text{sec}} = a}$$



$$d = v_i t + \frac{1}{2} a t^2$$

$$\boxed{\frac{2d}{a} = t}$$

$$\boxed{\frac{2 \cdot \frac{1}{2} \text{ m}}{2 \frac{\text{m}}{\text{sec}}} = t}$$

$$\boxed{\approx 0.71 \text{ sec}}$$