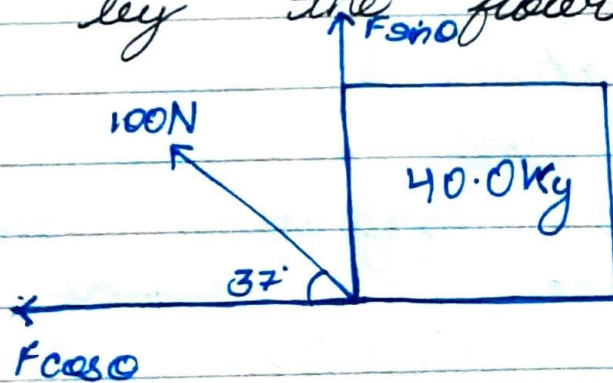


Home assignment →

- a
- 1) A student pulls a box of books on a smooth horizontal floor with a force of 100N in a direction of 37° above the horizontal surface. If the mass of the box & books is 40.0kg, what is the acceleration of the box & the normal force on the box by the floor?



$$F \cdot \cos \alpha = ma$$

$$\Rightarrow 100 \times \cos 37^\circ = 40a$$

$$\Rightarrow 100 \times 0.798 = 40a$$

$$\Rightarrow \frac{100 \times 0.798}{40} = a$$

$$\Rightarrow a = 1.995 \text{ ms}^{-2}$$

$$\Rightarrow a = 2 \text{ ms}^{-2} \text{ (approx.)}$$

2) (a) Does the earth exert a force on every particle near its surface?
Yes.

(b) Is this a long range force or contact force?
Long Range Force.

(c) What is the magnitude of this force on a particle of mass m ?
What is the direction of the force?

The magnitude of the force is ~~9.8m~~ $9.8mN$.

The direction of the force is towards center of the earth.

(d) $m_1 = 2kg$
 $m_2 = 10kg$
 $a = g = 9.8m/s^2$

① Gravitational force on A = ~~mg~~ ma
= 2 × 9.8
= 19.6 N

Gravitational force on B = ma
= 10 × 9.8
= 98 N

② The acceleration of both objects A & B is same i.e. 9.8 ms^{-1} .