Home Assignment

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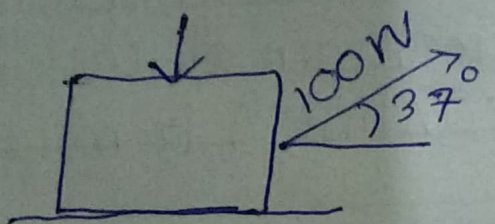

Force - 100N at an angle of 37°
Horizontal Force = 100 Cos 37°
Vertical ~~Force~~ Force = 100 Sin 37°
Mass = 40 kg
Gravitational Force
$= mg$ (g = 10 m/s²)
$= 40 \times 10 = 400$ N
At Equilibrium, total Gravitational force
= Total upward force (Vertical force)
= Normal Force + Vertical Force due to pull
Hence, Normal Force + 100 Sin 37° = 400N
$N = 400 - 100 \text{ Sin } 37°$
At Equilibrium $f = ma$
Horizontal Force $= ma$
$100 \text{ Cos } 37° = 40a$
$a = \frac{100 \text{ Cos } 37°}{40}$

So, Normal force is $(400 - 100 \text{ Sin } 37°)$
and Acceleration is $\left(\frac{100 \text{ Cos } 37°}{40}\right)$

(a)

(i) Yes, the earth exert a force on every particle near its surface.

(ii) Yes, it is a long-range force or contact force.

(iii) The magnitude of the particle is 9.8 m/s and the direction is vertically downward.

(iv)

(1) Gravitational force A = ma

= 2 × 9.8

= 19.6 N

Gravitational force B = ma

= 10 × 9.8

= 98 N

(2) As both the objects are falling freely, the acceleration of both object A and B are $9.8 m/s^2$.