$F = ma$
$\Rightarrow (0.098 - R) = (0.01)(-70)$
$\Rightarrow R = 0.798$ N

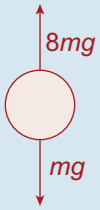
Q. 14. (i) **In Air**

$u = 0, \quad s = 4h, \quad a = g, \quad v = ?$

$v^2 = u^2 + 2as$
$\Rightarrow v^2 = 0 + 2(g)(4h)$
$\Rightarrow v = \sqrt{8gh}$

In Marsh

$F = mg - 8mg$
$= -7mg$



$F = ma$
$\Rightarrow -7mg = ma$
$\Rightarrow a = -7g$

$u = \sqrt{8gh}, \quad v = 0, \quad a = -7g,$
$s = ?$

$v^2 = u^2 + 2as$
$0 = 8gh + 2(-7g)s$
$\Rightarrow s = \frac{4}{7}h$

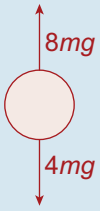
In Air

$u = 0, \quad s = h, \quad a = g, \quad v = ?$

$v^2 = u^2 + 2as$
$\Rightarrow v^2 = 0 + 2gh$
$\Rightarrow v = \sqrt{2gh}$

In Marsh

$F = 4mg - 8mg$
$= -4mg$



$F = ma$
$\Rightarrow -4mg = -(4m)a$
$\Rightarrow a = -g$

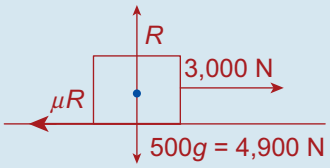
$u = \sqrt{2gh}, \quad a = -g, \quad v = 0, \quad s = ?$

$v^2 = u^2 + 2as$
$0 = 2gh + 2(-g)s$
$\Rightarrow s = h$

Answer: No

Exercise 5B

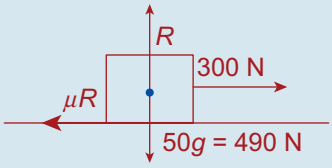
Q. 1.



$R = 4{,}900$
$\Rightarrow \mu R = (0.4)(4{,}900)$
$= 1{,}960$

$F = ma$
$\Rightarrow (3{,}000 - 1{,}960) = 500a$
$\Rightarrow a = 2.08$ m/s^2

Q. 2.

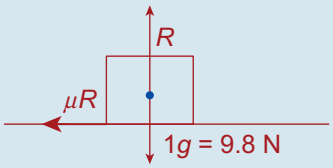


$R = 490$

$\Rightarrow \mu R = 0.6(490)$
$= 294$ N

$F = ma$
$\Rightarrow (300 - 294) = (50)a$
$\Rightarrow a = 0.12$ m/s^2

Q. 3. (i)



$R = 9.8$

$\Rightarrow$ Friction $= \mu R$

$= \left(\frac{1}{7}\right)(9.8)$

$= 1.4$ N

(ii) $F = ma$

$(-1.4) = (1)a$
$\Rightarrow a = -1.4$ m/s^2

The deceleration is 1.4 m/s^2

(iii) $u = 3.5, \quad v = 0, \quad a = -1.4, \quad s = ?$

$v^2 = u^2 + 2as$
$\Rightarrow 0 = 12.25 + 2(-1.4)s$
$\Rightarrow s = 4.375$ m