4. A block A of mass 9 kg is released from rest from a point P which is a height h metres above horizontal soft ground.

The block falls and strikes another block B of mass 1.5 kg which is on the ground vertically below P.

The speed of A immediately before it strikes B is $7\,\text{m}\,\text{s}^{-1}$.

The blocks are modelled as particles.

(a) Find the value of h.

(2)

Immediately after the impact the blocks move downwards together with the same speed and both come to rest after sinking a vertical distance of 12 cm into the ground.

Assuming that the resistance offered by the ground has constant magnitude R newtons,

(b) find the value of R.

(7)

(Total for Question 4 is 9 marks)