6 The photograph shows a hammer just before it hits a nail.

(a) The mass of the hammer is 0.50 kg.

When it hits the nail, the hammer is travelling downwards with a velocity of 3.1 m/s.

(i) State the relationship between momentum, mass and velocity.

(1)

(ii) Calculate the momentum of the hammer.

(2)

momentum = ... kg m/s

(iii) The hammer stops quickly when it hits the nail.

The momentum of the hammer reduces to zero in 0.070 s.

Calculate the amount of force that causes this to happen.

(2)

force = ... N

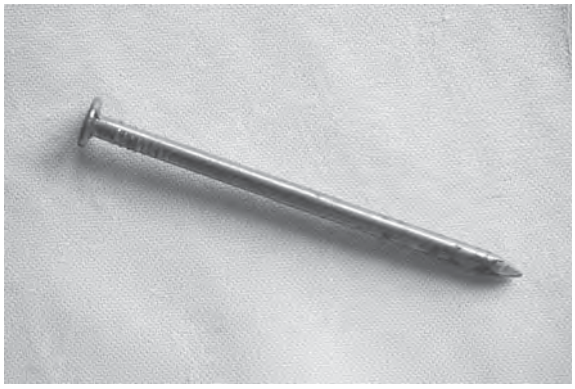
(b) As it enters the wood, the nail exerts a force on the wood.

At the same time, the wood exerts a force on the nail.

Explain how these two forces are related.

(2)

(c) Both ends of the nail exert pressure when the nail goes into the wood.



Explain why the nail exerts more pressure on the wood than it does on the hammer.

(2)

(Total for Question 6 = 9 marks)