

4 A nucleus P undergoes  $\alpha$ -decay to form nucleus Q.

(a) Complete the equation for this decay.



(b) (i) State the principle of conservation of momentum.

.....  
.....  
..... [2]

(ii) Before the decay, nucleus P has a speed of  $3.2 \times 10^5 \text{ m s}^{-1}$ . After the decay, nucleus Q is stationary.

Calculate the speed of the alpha particle after the decay.

speed = .....  $\text{m s}^{-1}$  [2]