7 An isolated stationary nucleus Q decays into nucleus R and an α-particle. The α-particle has speed $1.5 \times 10^7\,\text{m s}^{-1}$.

(a) Complete the equation for this decay.

$$^{.....}_{88}\text{Q} \longrightarrow {}^{222}_{.....}\text{R} + {}^{4}_{2}\alpha$$

[1]

(b) By considering momentum, calculate the speed of nucleus R after the decay.

speed = ... m s^{-1} [3]

(c) State **three** quantities that are conserved during the decay.

1 .....

2 .....

3 .....

[3]

[Total: 7]