

Two particles  $P$  and  $Q$ , of masses  $0.3\text{ kg}$  and  $0.2\text{ kg}$  respectively, are at rest on a smooth horizontal plane.  $P$  is projected at a speed of  $4\text{ m s}^{-1}$  directly towards  $Q$ . After  $P$  and  $Q$  collide,  $Q$  begins to move with a speed of  $3\text{ m s}^{-1}$ .

- (a) Find the speed of  $P$  after the collision. [2]

[illegible]

After the collision,  $Q$  moves directly towards a third particle  $R$ , of mass  $m$  kg, which is at rest on the plane. The two particles  $Q$  and  $R$  coalesce on impact and move with a speed of  $2 \text{ m s}^{-1}$ .

- (b)** Find  $m$ . [2]

[illegible]