

- 3** Three uniform small smooth spheres A , B and C have equal radii and masses m , km and m respectively, where k is a constant. The spheres are moving in the same direction along a straight line on a smooth horizontal surface, with B between A and C . The speeds of A , B and C are $2u$, u and $\frac{4}{3}u$ respectively. The coefficient of restitution between any pair of the spheres is $\frac{1}{2}$. After sphere A has collided with sphere B , sphere B collides with sphere C .

(i) Find an inequality satisfied by k .

[5]

[illegible]

- (ii) Given that $k = 2$, show that after B has collided with C there are no further collisions between any of the three spheres. [5]

[illegible]