

Two uniform small smooth spheres A and B have equal radii and masses $2m$ and m respectively. Sphere A is moving with speed u on a smooth horizontal surface when it collides directly with sphere B which is at rest. The coefficient of restitution between the spheres is $\frac{2}{3}$.

- (i) Find, in terms of u , the speeds of A and B after this collision. [4]

Sphere B is initially at a distance d from a fixed smooth vertical wall which is perpendicular to the direction of motion of A . The coefficient of restitution between B and the wall is $\frac{1}{2}$.

- (ii) Find, in terms of d and u , the time that elapses between the first and second collisions between A and B . [5]