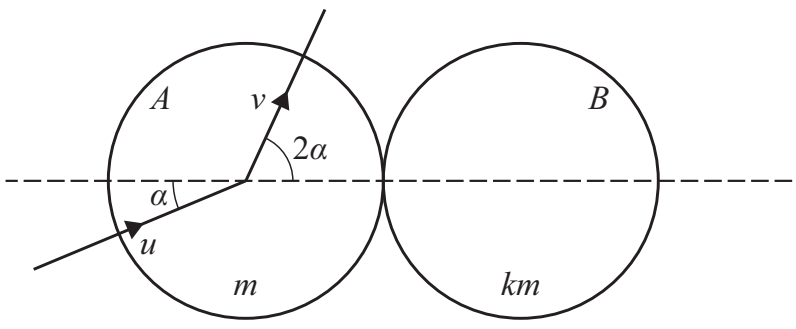
5 Two uniform smooth spheres, A and B, of equal radii are on a horizontal surface. They have masses of m and km respectively. Sphere A is moving with speed u at an angle α with the line of centres when it collides with sphere B which is stationary. Immediately after the collision, sphere A moves with speed v at an angle 2α with the line of centres (see diagram).



It is given that $\tan\alpha = \frac{3}{4}$.

(a) Find v in terms of u. [2]

(b) Find the coefficient of restitution between the spheres in terms of k. [4]

(c) Find the range of possible values of k. [3]