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4. Two small balls, A and B, are moving in opposite directions along the same straight line on smooth horizontal ground. The mass of A is $2m$ and the mass of B is $3m$.
The balls collide directly. Immediately before the collision, the speed of A is $2u$ and the speed of B is u. The coefficient of restitution between A and B is e, where $e > 0$

By modelling the balls as particles,

(a) show that the speed of B immediately after the collision is $\frac{1}{5}u(1 + 6e)$.

(6)

After the collision with ball A, ball B hits a smooth fixed vertical wall which is perpendicular to the direction of motion of B.

The coefficient of restitution between B and the wall is $\frac{5}{7}$

Ball B rebounds from the wall and there is a second direct collision between A and B.

(b) Find the range of possible values of e.

(4)

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