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7. Particle A of mass $3m$ is moving in a straight line with speed $2u$ on a smooth horizontal surface. Particle A collides directly with particle B of mass m, which is moving along the same straight line and in the same direction as A.

Immediately before the collision, the speed of B is u.

As a result of the collision, the direction of motion of B is unchanged and the kinetic energy gained by B is $\frac{48}{25}mu^2$

(a) Find the coefficient of restitution between A and B.

(8)

After the collision, B hits a smooth fixed vertical wall that is perpendicular to the direction of motion of B. The coefficient of restitution between B and the wall is f.

Given that the speed of B immediately after first hitting the wall is equal to the speed of A immediately after its first collision with B,

(b) find the value of f.

(2)

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