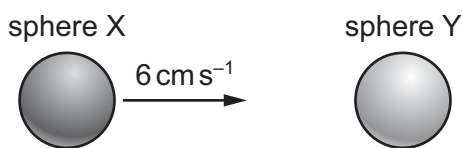


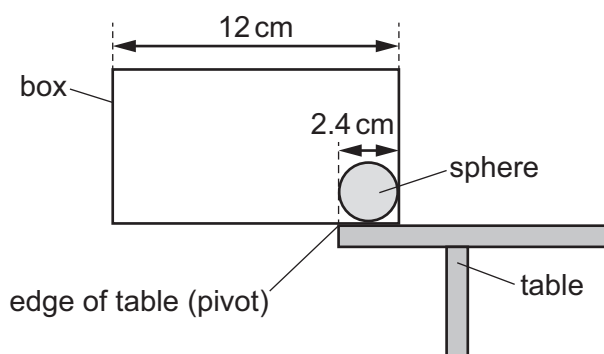
- 11 Two solid spheres form an isolated system. Sphere X moves with speed  $6 \text{ cm s}^{-1}$  in a straight line directly towards a stationary sphere Y, as shown.



The spheres have a perfectly elastic collision. After the collision, sphere X moves with speed  $2 \text{ cm s}^{-1}$  in the same direction as before the collision.

What is the speed of sphere Y?

- A  $2 \text{ cm s}^{-1}$       B  $4 \text{ cm s}^{-1}$       C  $6 \text{ cm s}^{-1}$       D  $8 \text{ cm s}^{-1}$
- 12 What is **not** a necessary requirement of the forces in a couple?
- A They act in opposite directions.  
B They act along different lines.  
C They have the same magnitude.  
D They produce a resultant force.
- 13 A box of length  $12 \text{ cm}$  and weight  $0.43 \text{ N}$  is placed on a horizontal table, with the greater part of its length overhanging the edge of the table. The edge of the table acts as a pivot. The centre of gravity of the box is at its geometric centre.



Assume that the forces acting on the box are in the plane of the diagram.

What is the minimum mass of the sphere that is needed to maintain the system in equilibrium?

- A  $0.066 \text{ kg}$       B  $0.13 \text{ kg}$       C  $0.22 \text{ kg}$       D  $1.3 \text{ kg}$