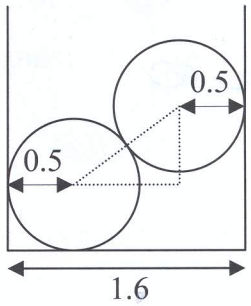
7. **(b)** Two uniform smooth spheres each of weight W and radius 0.5 m, rest inside a hollow cylinder of diameter 1.6 m.

2010

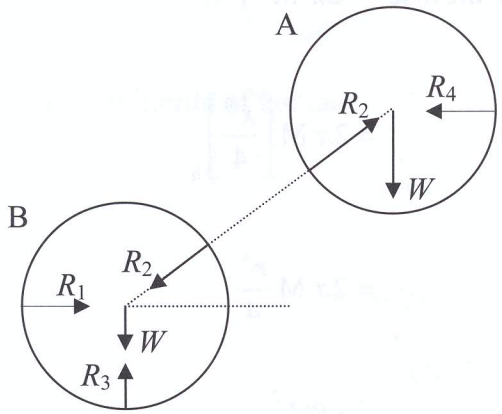


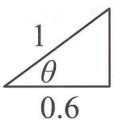
The cylinder is fixed with its base horizontal.

(i) Show on separate diagrams the forces acting on each sphere.

(ii) Find, in terms of W, the reaction between the two spheres.

(iii) Find, in terms of W, the reaction between the lower sphere and the base of the cylinder.





$\cos\theta = \frac{3}{5} \quad \Rightarrow \quad \sin\theta = \frac{4}{5}$

(ii) Sphere A

$R_2 \sin\theta = W$

$R_2\left(\frac{4}{5}\right) = W$

$R_2 = \frac{5W}{4}$

(iii) Sphere B

$R_3 = R_2 \sin\theta + W$

$R_3 = W + W$

$R_3 = 2W$

5 5 5 5 5

25