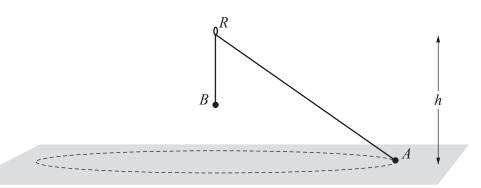
6



A light inextensible string is threaded through a fixed smooth ring R which is at a height h above a smooth horizontal surface. One end of the string is attached to a particle A of mass m. The other end of the string is attached to a particle B of mass $\frac{6}{7}m$. The particle B moves in a horizontal circle on the surface. The particle B hangs in equilibrium below the ring and above the surface (see diagram).

When A has constant angular speed ω , the angle between AR and BR is θ and the normal reaction between A and the surface is N.

When A has constant angular speed $\frac{3}{2}\omega$, the angle between AR and BR is α and the normal reaction between A and the surface is $\frac{1}{2}N$.

(a)	Show that $\cos \theta = \frac{4}{9} \cos \alpha$.	[5]

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Find N in terms o	f m and g and find	d the value of co	sα.	
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