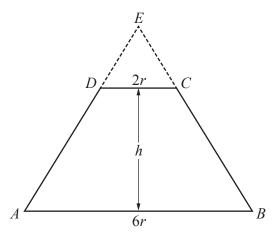**4**

The diagram shows the cross-section *ABCD* of a uniform solid object which is formed by removing a cone with cross-section *DCE* from the top of a larger cone with cross-section *ABE*. The perpendicular distance between *AB* and *DC* is h, the diameter *AB* is $6r$ and the diameter *DC* is $2r$.

(a) Find an expression, in terms of h, for the distance of the centre of mass of the solid object from *AB*.

[4]

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The object is freely suspended from the point B and hangs in equilibrium. The angle between AB and the downward vertical through B is θ.

(b) Given that $h = \frac{13}{4}r$, find the value of $\tan\theta$. [2]

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