

Write your name here

Surname

Other names

Pearson
Edexcel GCE

Centre Number

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Candidate Number

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Mechanics M3

Advanced/Advanced Subsidiary

Wednesday 18 May 2016 – Morning
Time: 1 hour 30 minutes

Paper Reference

6679/01

You must have:

Mathematical Formulae and Statistical Tables (Pink)

Total Marks

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Candidates may use any calculator allowed by the regulations of the Joint Council for Qualifications. Calculators must not have the facility for symbolic algebra manipulation, differentiation and integration, or have retrievable mathematical formulae stored in them.

Instructions

- Use **black** ink or ball-point pen.
- If pencil is used for diagrams/sketches/graphs it must be dark (HB or B). Coloured pencils and highlighter pens must not be used.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions and ensure that your answers to parts of questions are clearly labelled.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- You should show sufficient working to make your methods clear. Answers without working may not gain full credit.
- Whenever a numerical value of g is required, take $g = 9.8 \text{ m s}^{-2}$, and give your answer to either two significant figures or three significant figures.
- When a calculator is used, the answer should be given to an appropriate degree of accuracy.

Information

- The total mark for this paper is 75.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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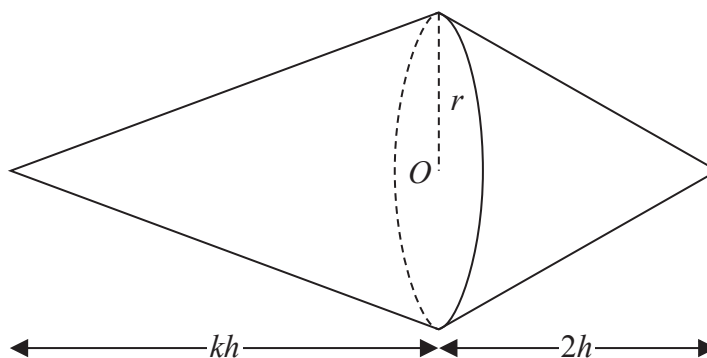


Figure 2

A uniform solid S consists of two right circular cones of base radius r . The smaller cone has height $2h$ and the centre of the plane face of this cone is O . The larger cone has height kh where $k > 2$. The two cones are joined so that their plane faces coincide, as shown in Figure 2.

(a) Show that the distance of the centre of mass of S from O is

$$\frac{h}{4}(k - 2) \tag{5}$$

The point A lies on the circumference of the base of one of the cones. The solid is suspended by a string attached at A and hangs freely in equilibrium.

Given that $r = 3h$ and $k = 6$

(b) find the size of the angle between AO and the vertical. (3)

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