

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Pearson Edexcel
International
Advanced Level

Centre Number

Candidate Number

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Wednesday 15 May 2019

Morning (Time: 1 hour 30 minutes)

Paper Reference **WME03/01**

Mathematics

International Advanced Subsidiary/Advanced Level
Mechanics M3

You must have:

Mathematical Formulae and Statistical Tables (Blue), calculator

Total Marks

Candidates may use any calculator permitted by Pearson regulations. 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).
- **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.
- Inexact answers should be given to three significant figures unless otherwise stated.

Information

- A booklet 'Mathematical Formulae and Statistical Tables' is provided.
- There are 7 questions in this question paper. 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.
- If you change your mind about an answer, cross it out and put your new answer and any working underneath.

Turn over ►

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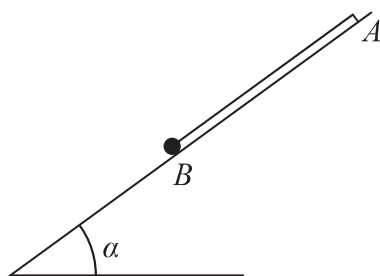


Figure 4

A particle P of mass m is attached to one end of a light elastic string, of natural length l and modulus of elasticity λ . The other end of the string is attached to a fixed point A on a smooth plane which is inclined to the horizontal at angle α , where $\sin \alpha = \frac{3}{5}$. The particle rests in equilibrium on the plane at the point B with the string lying along a line of greatest slope of the plane, as shown in Figure 4.

Given that $AB = \frac{7}{5}l$

(a) show that $\lambda = \frac{3}{2}mg$ (3)

The particle is now pulled down the line of greatest slope to the point C , where $BC = \frac{4}{5}l$, and released from rest.

(b) (i) Show that, while the string remains taut, P moves with simple harmonic motion with centre B .

(ii) Explain briefly why the centre of the motion is at B . (5)

(c) Find the time taken by P to travel directly from C to B . (2)

The particle comes to instantaneous rest for the first time at the point D .

(d) Find, in terms of l and g , the time taken by P to travel directly from C to D . (6)

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