

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Pearson Edexcel
Level 3 GCE

Centre Number

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Candidate Number

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Mock Paper

Paper Reference **9MA0-32**

Mathematics
Advanced
Paper 32: Mechanics

You must have:

Mathematical Formulae and Statistical Tables, calculator

Total Marks

Candidates may use any calculator allowed 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.
- Answers should be given to three significant figures unless otherwise stated.

Information

- A booklet 'Mathematical Formulae and Statistical Tables' is provided.
- The total mark for this part of the examination is 50. There are 5 questions.
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*
- Unless otherwise stated, whenever a value of g is required, take $g = 9.8 \text{ m s}^{-2}$ and give your answer to either 2 significant figures or 3 significant figures.

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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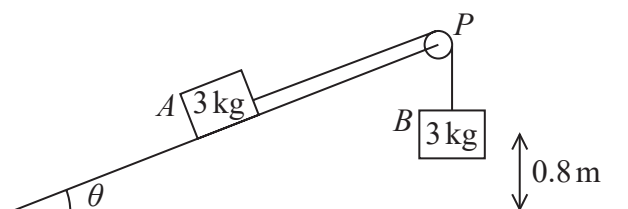


Figure 3

Two packages A and B , each of mass 3 kg , are attached to the ends of a rope.

Initially A is held at rest on a smooth fixed plane that is inclined at angle θ to the horizontal ground, where $\sin \theta = \frac{2}{7}$

The rope passes over a pulley, P , fixed at the top of the plane.

The pulley is modelled as small and smooth.

The part of the string from A to P is parallel to a line of greatest slope of the plane.

Package B hangs freely below P , as shown in Figure 3.

The packages are released from rest with the string taut and A moves up the plane.

In this model, the packages are modelled as particles and the rope as a light inextensible string.

The magnitude of the tension in the string immediately after the packages are released is T newtons.

(a) Find the value of T . (6)

At the instant when the packages are released from rest, B is 0.8 m above the ground and A is at the point C on the plane.

When B reaches the ground, B is immediately brought to rest by the impact with the ground.

In the subsequent motion, A does not reach P and comes to instantaneous rest at the point D on the plane.

(b) Find the distance CD . (5)

(c) State two limitations of the model that could affect the reliability of your answers. (2)



