

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

Candidate Number

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Pearson Edexcel Level 3 GCE

Friday 17 May 2024

Afternoon

Paper
reference

8FM0/26

Further Mathematics

Advanced Subsidiary

Further Mathematics options

26: Further Mechanics 2

(Part of option J)

You must have:

Mathematical Formulae and Statistical Tables (Green), 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.
- Unless otherwise indicated, 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.

Information

- A booklet 'Mathematical Formulae and Statistical Tables' is provided.
- The total mark for this part of the examination is 40. There are 4 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.*

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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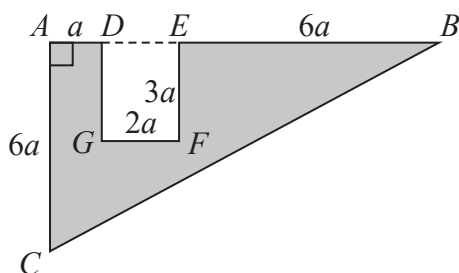


Figure 3

The uniform triangular lamina ABC has AB perpendicular to AC , $AB = 9a$ and $AC = 6a$. The point D on AB is such that $AD = a$.

The rectangle $DEFG$, with $DE = 2a$ and $EF = 3a$, is removed from the lamina to form the template shown shaded in Figure 3.

The distance of the centre of mass of the template from AC is d .

(a) Show that $d = \frac{23}{7}a$ (3)

The template is freely suspended from A and hangs in equilibrium with AB at an angle θ° to the downward vertical through A .

(b) Find the value of θ (5)

A new piece, of exactly the same size and shape as the template, is cut from a lamina of a different uniform material. The template and the new piece are joined together to form the model shown in Figure 4. Both parts of the model lie in the same plane.

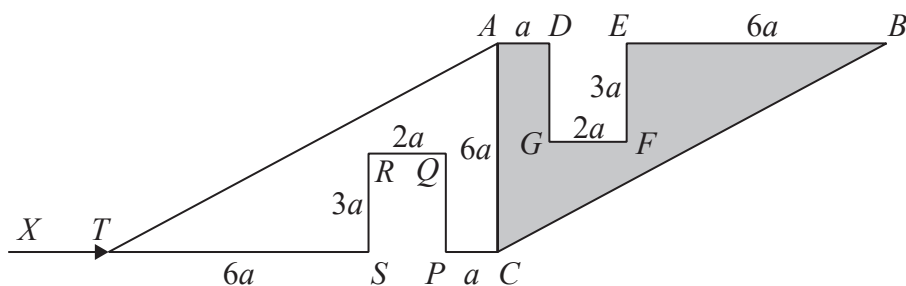


Figure 4

The weight of $CPQRSTA$ is W

The weight of $ADGFEB$ is $4W$

The model is freely suspended from A .

A horizontal force of magnitude X , acting in the same vertical plane as the model, is now applied to the model at T so that AC is vertical, as shown in Figure 4.

(c) Find X in terms of W . (4)



