

New
Specification

Rewarding Learning

ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2019

Centre Number

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Candidate Number

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Mathematics

Assessment Unit AS 2

assessing

Applied Mathematics



[SMT21]

SMT21

WEDNESDAY 22 MAY, MORNING

TIME

1 hour 15 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

You must answer the questions in the spaces provided.

Do not write outside the boxed area on each page, on blank pages or tracing paper.

Complete in black ink only. Questions which require drawing or sketching should be completed using an HB pencil. **Do not write with a gel pen.**

Candidates must answer **all** questions from sections A and B.

Equal time should be spent on each section. Show clearly the full development of your answers.

Answers without working may not gain full credit.

Answers should be given to three significant figures unless otherwise stated.

You are permitted to use a graphic or scientific calculator in this paper.

INFORMATION FOR CANDIDATES

The total mark for this paper is 70. The total available mark for each section of this paper is 35.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

Answers should include diagrams where appropriate and marks may be awarded for them.

Take $g = 9.8 \text{ m s}^{-2}$, unless specified otherwise.

A copy of the **Mathematical Formulae and Tables booklet** is provided.

Throughout the paper the logarithmic notation used is $\ln z$ where it is noted that $\ln z \equiv \log_e z$

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- 4 **Fig. 3** below shows two boxes, A and B, connected by a rope passing over a smooth, light, fixed pulley.

Box A is held at rest on a rough horizontal table 5 m from the pulley.

Box B hangs 2.5 m vertically above the floor.

A and B have masses 8 kg and 6 kg respectively.

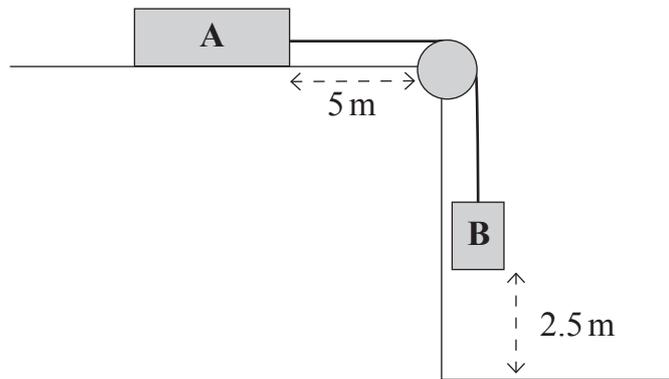
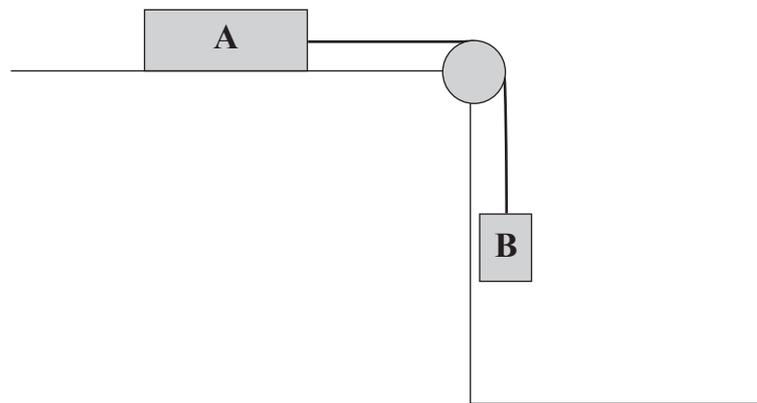


Fig. 3

Box A is released from rest.

- (i) Complete the diagram below showing all the external forces acting on A and B.

[2]





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SECTION B

Statistics

5 (a) Explain the difference between a census and a sample. [2]

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(b) A market researcher is interested to find out the opinions of nurses living in Northern Ireland.

To get a random sample, he questions women that he meets entering the Royal Victoria Hospital on a Monday morning after 9 am.

Give two reasons to explain why this sampling procedure is not satisfactory. [2]

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- (b) The histogram in **Fig. 4** below shows the weekly incomes, in £, of a random sample of households in a neighbourhood.

Histogram showing weekly incomes

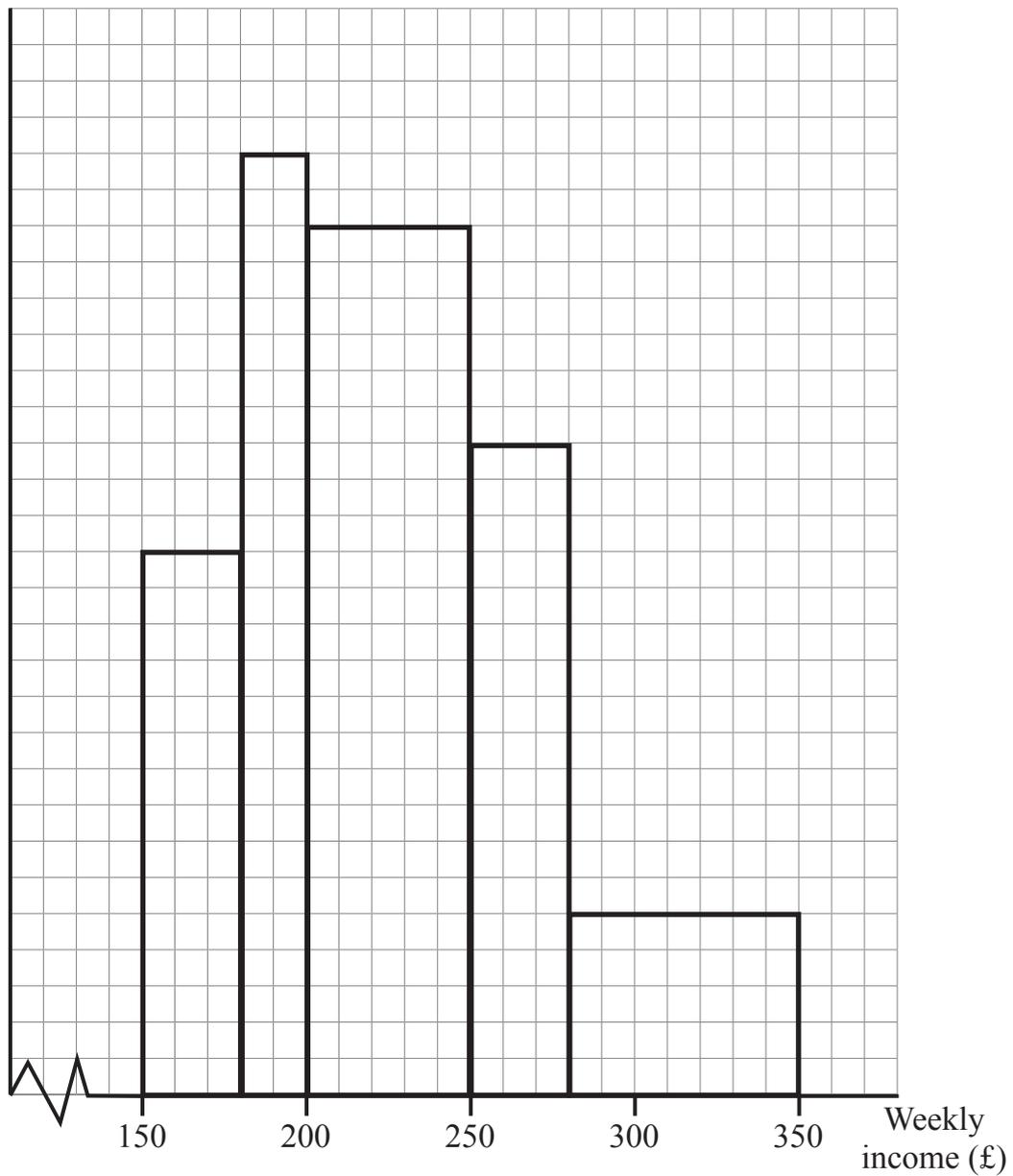


Fig. 4





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For Examiner's use only	
Question Number	Marks
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8	

Total Marks	
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Examiner Number

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