

GENERAL CERTIFICATE OF SECONDARY EDUCATION

B274/B

MATHEMATICS C

MODULE M4 – SECTION B

SPECIMEN

Candidates answer on the question paper.

Time: 30 minutes

Additional Materials:

- Geometrical instruments
- Tracing paper (optional)
- Electronic or graphical calculator



Candidate
Name

Centre
Number

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Candidate
Number

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INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above.
- Answer **all** the questions.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- In many questions marks will be given for a correct method even if the answer is incorrect.
- Do **not** write in the bar code.
- Do **not** write outside the box bordering each page.
- WRITE YOUR ANSWER TO EACH QUESTION IN THE SPACE PROVIDED. ANSWERS WRITTEN ELSEWHERE WILL NOT BE MARKED.

INFORMATION FOR CANDIDATES

- You are expected to use a calculator in Section B of this paper.
- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this section is 25.
- Section B starts with Question 8.

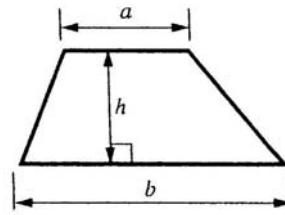
For Examiner's Use

Section B

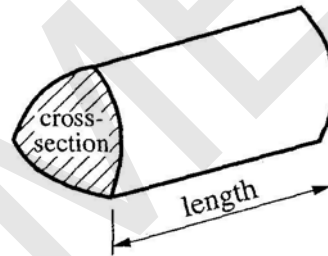
This document consists of **9** printed pages and **3** blank pages.

2
FORMULAE SHEET

Area of trapezium = $\frac{1}{2}(a+b)h$



Volume of prism = (area of cross-section) x length



- 8 (a) Sputnik 1 was the first satellite to go into space.

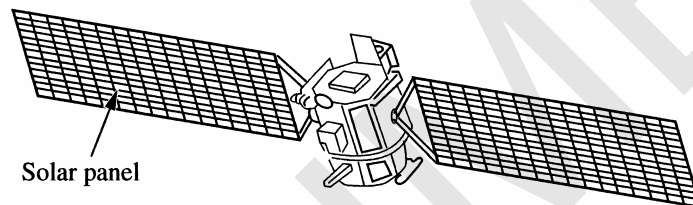
It went round the Earth at a height of 150 miles.

What is 150 miles in kilometres?

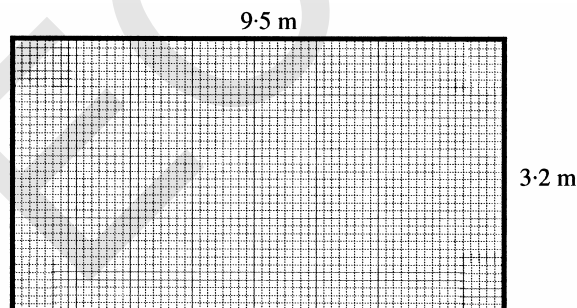


(a) _____ km [1]

- (b) Modern satellites use solar panels to get electric power from sunlight.



One square metre of solar panel gives 100 watts of electric power.



How much electric power could this solar panel give?

(b) _____ watts [2]

3	
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[Turn over

- 9 (a) This table shows equivalent UK and European shoe sizes.

UK Shoe Size (u)	1	2	3	4	5
European Shoe Size (e)	33	34	35	$36\frac{1}{2}$	$37\frac{1}{2}$

Amy writes down this formula connecting UK shoe size (u) and European shoe size (e).

$$e = u + 32$$

Does her formula work for all of these sizes?

Explain how you decide.

_____ because _____

[2]

- (b) This table shows equivalent UK and American shoe sizes.

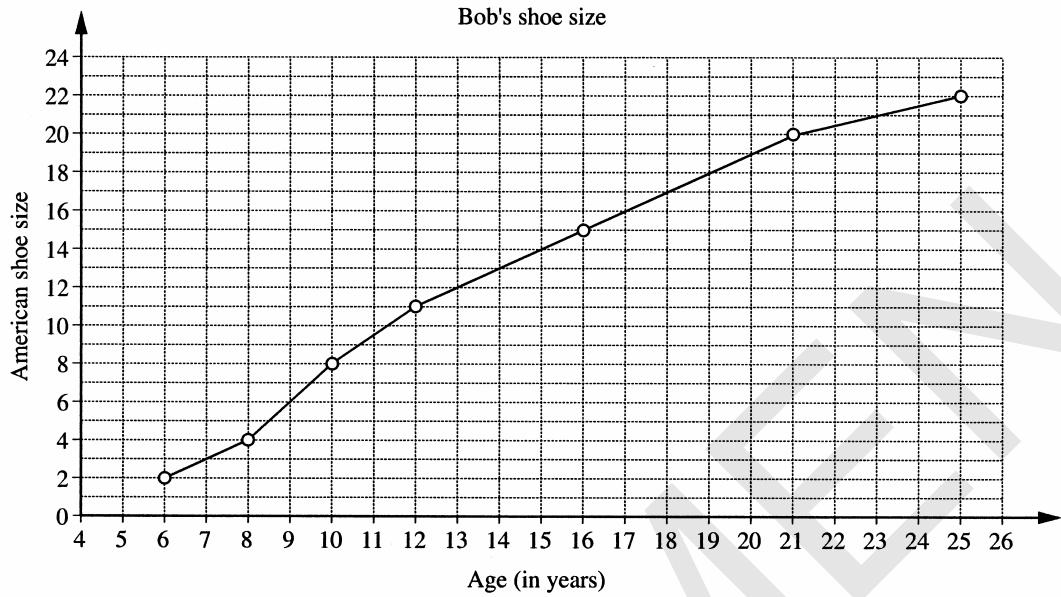
UK Shoe Size (u)	1	2	3	4	5
American Shoe Size (a)	$2\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$

Write down a formula connecting UK shoe size (u) and American shoe size (a).

(b) _____

[2]

- 9 (c) Bob is a professional American basketball player.
The graph below shows how his shoe size changed as he grew up.



- (i) How old was Bob when he had shoe size 15?

(c)(i)

[1]

- (ii) An increase in shoes size of 1 means an increase in foot length of 9 mm.
By how many millimetres did Bob's foot length increase between the age of 8 and 16?

(ii)

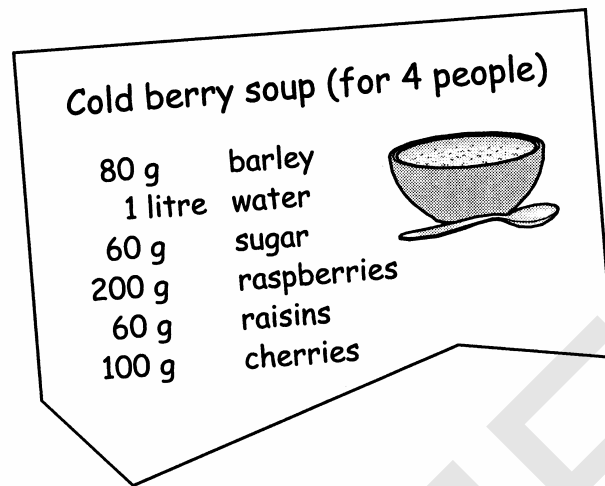
mm

[2]

7	
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[Turn over

- 10** This is a recipe for cold berry soup.
It makes soup for 4 people.



- (a)** How much barley do you need to make soup for 12 people?

(a) _____ g [1]

- (b)** Pat uses 50g of cherries to make this soup.
How many people is it for?

(b) _____ [1]

- (c)** How much sugar is needed to make soup for 10 people?

(c) _____ g [1]

3

- 11 Solve this number puzzle using trial and improvement.

I think of a number.
I divide it by 2.5 then multiply the result by itself.
The answer is 900.
What number am I thinking of?

The first two trials have been done for you.
Show all your working.
You may not need to use all the lines.

Trial	Working	Too Small	Too Large
30	$30 \div 2.5 = 12$ $12 \times 12 = 144$	✓	
90	$90 \div 2.5 = 36$ $36 \times 36 = 1296$		✓

[3]

3	
---	--

[Turn over

12 (a)



The shoe sizes of the eight girls in a basketball squad are shown below.

4 5 5 6 6 6 7 7

One of the girls is chosen at random.

What is the probability that her shoe size is

(i) 7,

(a)(i) _____ [1]

(ii) 4 or 5,

(ii) _____ [1]

(iii) greater than 5?

(iii) _____ [1]

(b) Amber plays for her college basketball squad.

Here are the numbers of points she has scored in her last five games.

12 9 0 17 12

(i) Find the range of Amber's scores.

(b)(i) _____ [1]

(ii) Work out her mean score for the five games.

(ii) _____ [3]

7	
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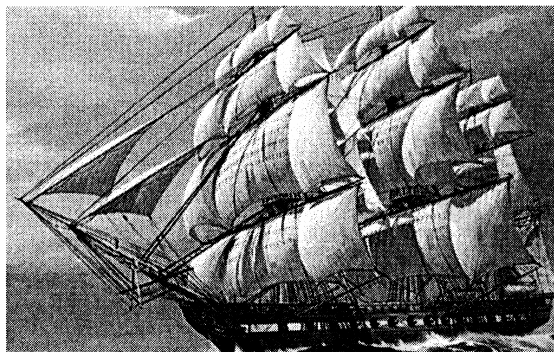
13 The fathom is an old unit used to measure depths at sea.

The average depth of the Pacific Ocean is 2340 fathoms.

A fathom is 6 feet.

One foot is 0.305 metres.

What is 2340 fathoms in metres?



..... [2]

2	
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Section B Total [25]

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SPECIMEN

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The maximum mark for this paper is 25.

SPECIMEN

8	(a) (b)	210 - 270 (km) 3040	1 2 3		M1 for attempt at 9.5×3.2 – can be implied by digits '304' seen
9	(a) (b) (c)(i) (ii)	No Because: "worked result that does not fit" $a = u + 1.5$ or equivalent (could be word equation) 16 $11 \times 9 = 99$	1 1 2 1 M1 A1 7		Dependent on some form of explanation – but not necessarily correct "Must be whole number" see LIST Not dependent on "no" blank OK If zero award M1 for ± 1.5 seen in a word/letter expression CAO If zero scored SC1 for 11 seen
10	(a) (b) (c)	240 2 150	1 1 1 3		
11		75 with supporting working (if 75 last trial accept 900 or nothing on answer line for 3)	3 3		M1 for trial between 30 and 90 M1 for better trial A1 CAO SC2 75 with no working
12	(a)(i) (ii) (iii) (b)(i) (ii)	$\frac{2}{8}$ or equivalent $\frac{3}{8}$ o.e. (0.375, 37.5%) $\frac{5}{8}$ o.e. (0.625, 62.5%) 17 50 (seen) $\div 5 = 10$	1 1 1 1 M1 M1 A1 7		Accept fractions, decimals or percentages only in (a) Ratio (a in b chance) penalise just once. If zero for part (a) award 1 for any of (i), (ii), or (iii) showing '8' as a denominator (must be a vulgar fraction) M1 $12 + 9 + (0) + 17 + 12$ seen These two M1s are independent

13	2340 x 6 x 0.305 = 4282.2 <i>accept # 4280 or 4282</i>	M1 A1 2	⇒ M1 for digits 42822 seen SC1 for 14040 or 713.7
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Section B Total 25

SPECIMEN

Assessment Objectives Grid

Question	A02	A03	A04	Total
8		3		3
9	7			7
10	3			3
11	3			3
12			7	7
13	2			2
Totals	15	3	7	25