



M9

GENERAL CERTIFICATE OF SECONDARY EDUCATION
MATHEMATICS C (GRADUATED ASSESSMENT)
 MODULE M9 (SECTION A)

B279A

Candidates answer on the question paper.

OCR supplied materials:
None

Other materials required:

- Geometrical instruments
- Tracing paper (optional)

Tuesday 21 June 2011
Afternoon

Duration: 30 minutes



Candidate forename		Candidate surname	
--------------------	--	-------------------	--

Centre number						Candidate number			
---------------	--	--	--	--	--	------------------	--	--	--

MODIFIED LANGUAGE

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Show your working. Marks may be given for a correct method even if the answer is incorrect.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Answer **all** the questions.
- Do **not** write in the bar codes.

INFORMATION FOR CANDIDATES

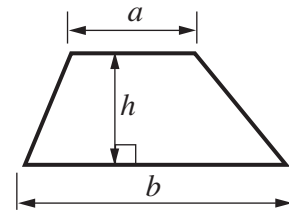
- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this Section is **25**.
- This document consists of **8** pages. Any blank pages are indicated.

WARNING

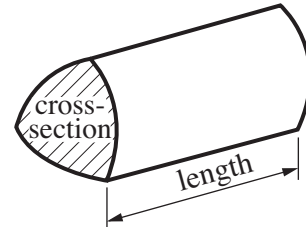
No calculator can be used for Section A of this paper

Formulae Sheet

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



Volume of prism = (area of cross-section) \times length

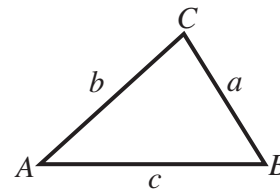


In any triangle ABC

Sine rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

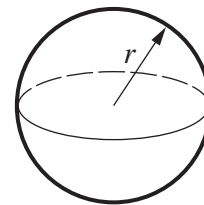
Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$

Area of triangle = $\frac{1}{2}ab \sin C$



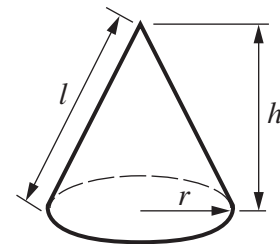
Volume of sphere = $\frac{4}{3}\pi r^3$

Surface area of sphere = $4\pi r^2$



Volume of cone = $\frac{1}{3}\pi r^2 h$

Curved surface area of cone = $\pi r l$



The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$, where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

PLEASE DO NOT WRITE ON THIS PAGE

1 Work out.

(a) 64^0

(a) [1]

(b) 6^{-2}

(b) [1]

(c) $16^{\frac{3}{4}}$

(c) [2]

2 Rearrange this formula to make r the subject.

$$V = \frac{2}{3}\pi r^3$$

..... [3]

3 Estimate.

$$4.093 \times 10^5 \times 7.971 \times 10^{11}$$

Give your answer in standard form.

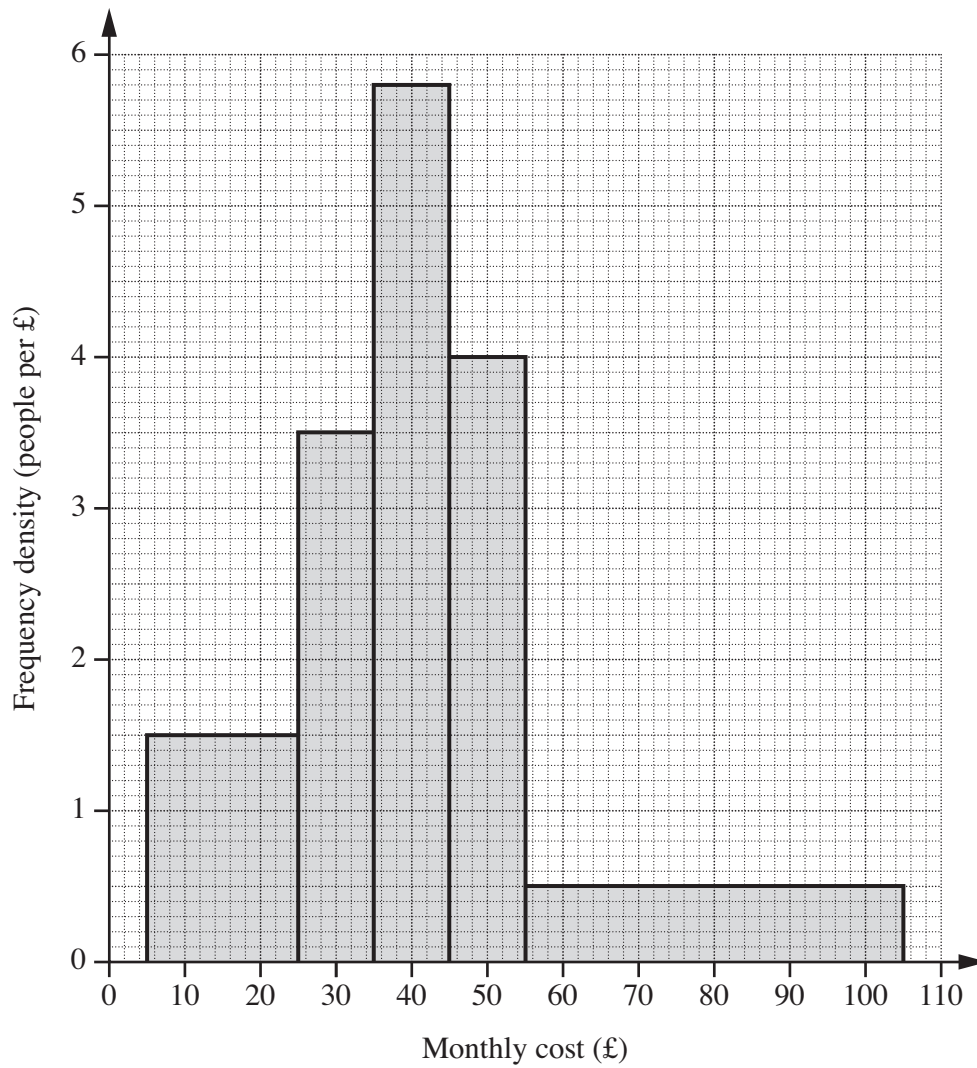
..... [2]

4 Andrew's weight is 66 kg, correct to the nearest kilogram.
Harris's weight is 64.3 kg, correct to the nearest 0.1 kg.

Calculate the upper bound of the difference in the boys' weights.

..... kg [3]

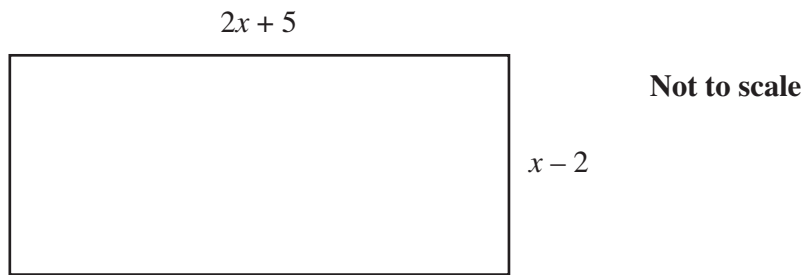
5 The histogram shows the distribution of monthly costs of mobile phones for a sample of people.



How many people were in the sample altogether?

..... [3]

- 6 The diagram shows a rectangle.
All lengths in the diagram are in metres.



The area of the rectangle is 18 m^2 .

- (a) Show that $2x^2 + x - 28 = 0$.

[3]

- (b) (i) Solve the equation $2x^2 + x - 28 = 0$ by factorising.

(b)(i) [3]

- (ii) State the length and width of the rectangle.

(ii) m and m [1]

7 A has coordinates (0, 5) and B has coordinates (3, -1).

(a) Show that the gradient of the line AB is -2.

[1]

(b) Find the equation of the line perpendicular to AB that passes through A.
Give your answer in the form $y = mx + c$.

(b) [2]

PLEASE DO NOT WRITE ON THIS PAGE



Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact the Copyright Team, First Floor, 9 Hills Road, Cambridge CB2 1GE.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.