

Candidate forename						Candidate surname					
Centre number						Candidate number					

OXFORD CAMBRIDGE AND RSA EXAMINATIONS
GENERAL CERTIFICATE OF SECONDARY EDUCATION

B278A

MATHEMATICS C
(GRADUATED ASSESSMENT)

MODULE M8 – SECTION A

TUESDAY 1 MARCH 2011: Morning

DURATION: 30 minutes

SUITABLE FOR VISUALLY IMPAIRED CANDIDATES

Candidates answer on the question paper.

OCR SUPPLIED MATERIALS:

None

OTHER MATERIALS REQUIRED:

Geometrical instruments

Tracing paper (optional)

WARNING

**No calculator can be used for
Section A of this paper.**

READ INSTRUCTIONS OVERLEAF

INSTRUCTIONS TO CANDIDATES

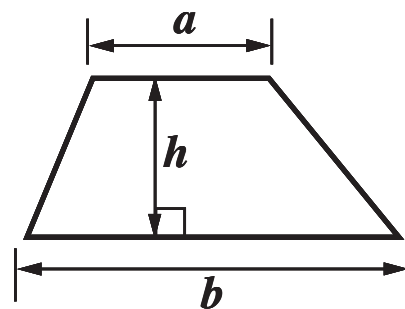
- **Write your name, centre number and candidate number in the boxes on the first page. Please write clearly and in capital letters.**
- **Use black ink. Pencil may be used for graphs and diagrams only.**
- **Read each question carefully. Make sure you know what you have to do before starting your answer.**
- **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).**
- **Show your working. Marks may be given for a correct method even if the answer is incorrect.**
- **Answer ALL the questions.**

INFORMATION FOR CANDIDATES

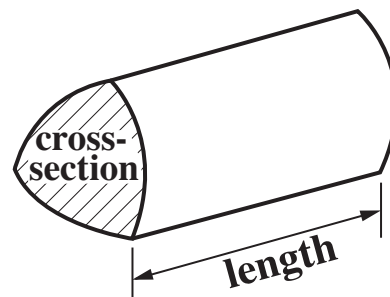
- **The number of marks is given in brackets [] at the end of each question or part question.**
- **The total number of marks for this Section is 25.**

FORMULAE SHEET

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



Volume of prism $= (\text{area of cross-section}) \times \text{length}$

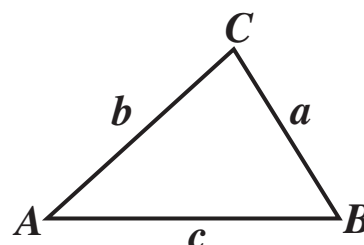


In any triangle ABC

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

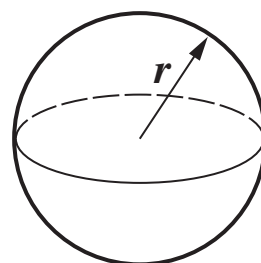
Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$

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



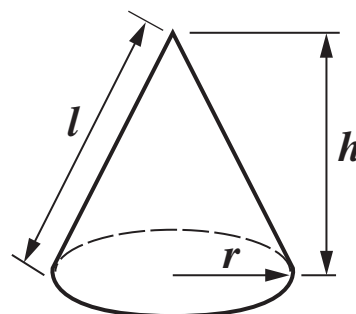
Volume of sphere $= \frac{4}{3}\pi r^3$

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

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

1 Work out.

$$2\frac{1}{5} + 1\frac{3}{4}$$

**Give your answer as a mixed number in its simplest form.
[3 marks]**

2 (a) Make p the subject of this formula. [3 marks]

$$r = \frac{p^2}{3} - 4$$

(a)

(b) Expand and simplify.

$$(x - 5)(x + 2)$$

[2 marks]

(b) _____

3 (a) What is the gradient of the line $y = 3x - 4$? [1 mark]

(a) _____

(b) Give the y -coordinate of the point where the line $y = 3x - 4$ crosses the y -axis. [1 mark]

(b) _____

(c) Give the equation of a line parallel to $y = 3x - 4$. [1 mark]

(c) _____

4 In this expression a and b represent lengths.

**Which one of these expressions could represent a volume?
Give a reason for your answer. [2 marks]**

$$a^2 + b^2$$

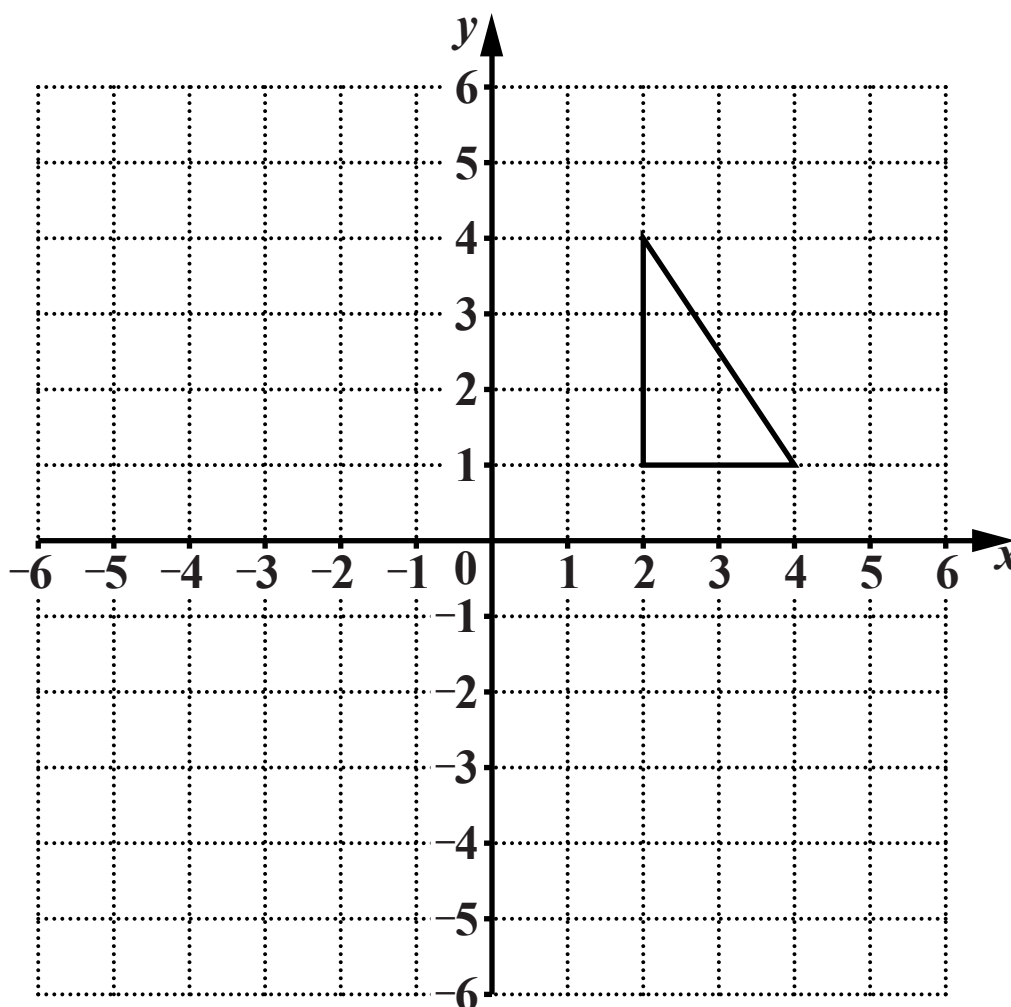
$$\pi a^2(a + b)$$

$$3a + 3b$$

$$\frac{1}{2}a(b^2 + a)$$

_____ because _____

- 5** You may use the diagram below to help you answer the question that follows.



Find the **SINGLE** transformation that is equivalent to:

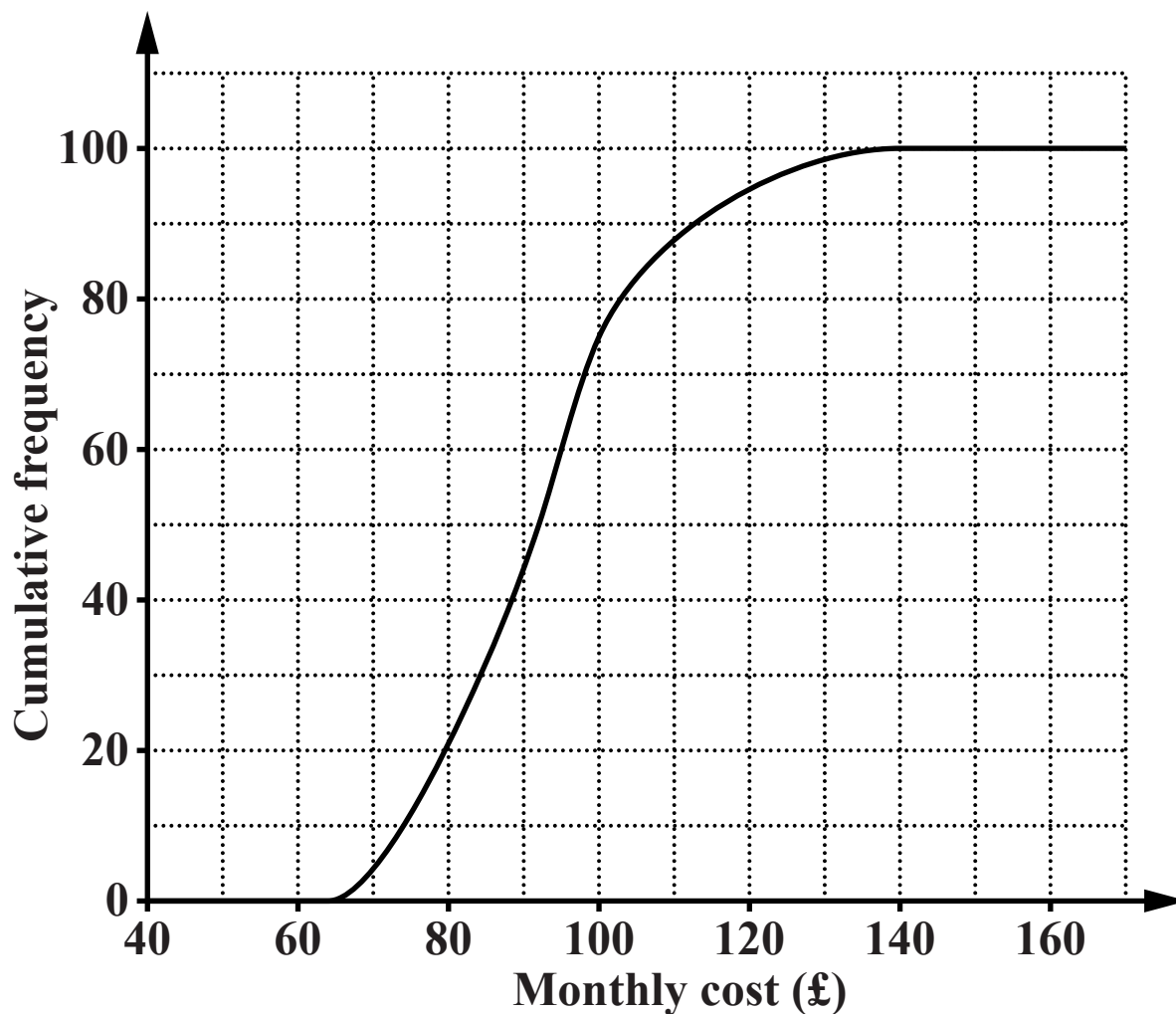
a translation by the vector $\begin{pmatrix} -4 \\ 0 \end{pmatrix}$ followed by a rotation of 180° about $(0, 0)$. [4 marks]

The single transformation is _____

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TURN OVER FOR QUESTIONS 6 AND 7

- 6 The cumulative frequency graph summarises the total monthly cost of gas and electricity for 100 households using the *Gaztec* company.



(a) Find

(i) the median, [1 mark]

(a)(i) £ _____

(ii) the interquartile range. [2 marks]

(ii) £ _____

- (b) *Sparks* is another company providing gas and electricity for households.

In a survey of 100 households using *Sparks*, the median charge was £84 and the interquartile range was £25.

Use this information to make two comparisons between the distributions of the charges of the two companies.

1 _____
_____ [1 mark]

2 _____
_____ [1 mark]

- 7 The average thickness of the Arctic sea ice in 2000 was reported to be 40% less than in 1970.
In 2000, the average thickness of the Arctic sea ice was 1.8 m.

What was its thickness in 1970? [3 marks]

_____ m

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