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

THURSDAY 21 JANUARY 2010: Afternoon
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

DC (LEO/CGW) MEP10108 23558/2

INSTRUCTIONS TO CANDIDATES

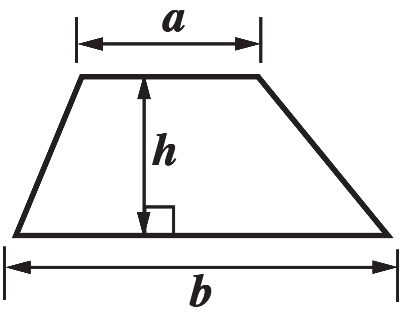
- **Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes on the first page.**
- **Use black ink. Pencil may be used for graphs and diagrams only.**
- **Read each question carefully and make sure that you know what you have to do before starting your answer.**
- **Show your working. Marks may be given for a correct method even if the answer is incorrect.**
- **Answer ALL the questions.**
- **Write your answer to each question in the space provided, however additional paper may be used if necessary.**

INFORMATION FOR CANDIDATES

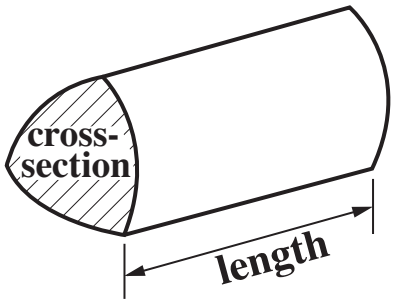
- **The number of marks is given in brackets [ ] at the end of each question or part question.**
- **The total number of marks for this Section is 25.**

FORMULAE SHEET

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



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

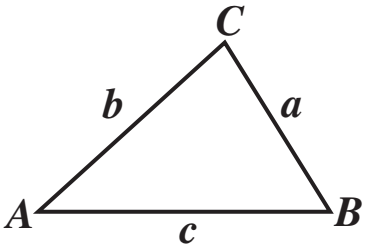


In any triangle ABC

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

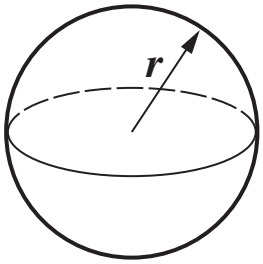
Cosine rule $a^2 = b^2 + c^2 - 2bc\cos A$

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



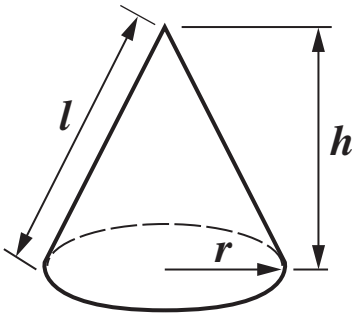
Volume of sphere $= \frac{4}{3}\pi r^3$

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



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

Curved surface area of cone $= \pi rl$

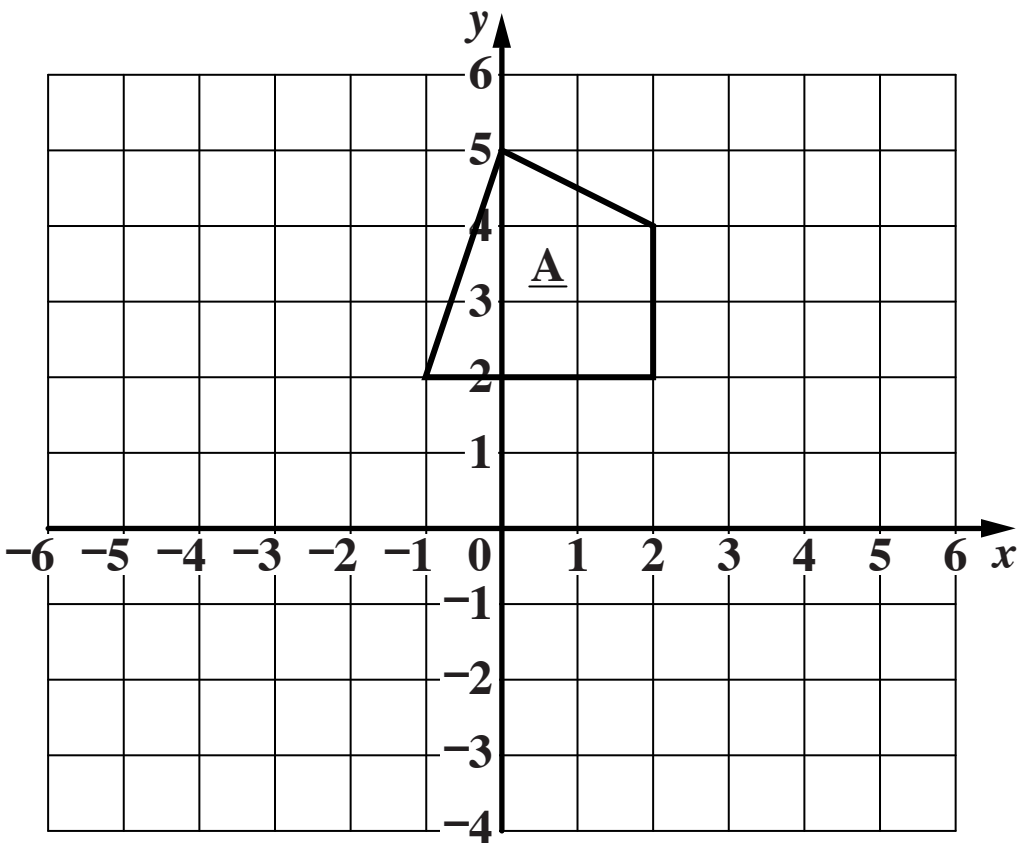


The Quadratic Equation

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 The diagram below shows a shape labelled A.



(a) Rotate shape A through 180° with centre (2, 2).
Label the image B.
[2 marks]

(b) Translate shape B by the vector $\begin{pmatrix} -6 \\ 0 \end{pmatrix}$.

Label the image C.
[2 marks]

(c) Describe fully the SINGLE transformation which maps shape A onto shape C.
[2 marks]

_____

_____

2 Heather has some shares in a company.
She paid £5 for each share.
Each share is now worth £8·50.

Work out the percentage increase in the value of each share.
[3 marks]

_____ **%**

3 Work out.

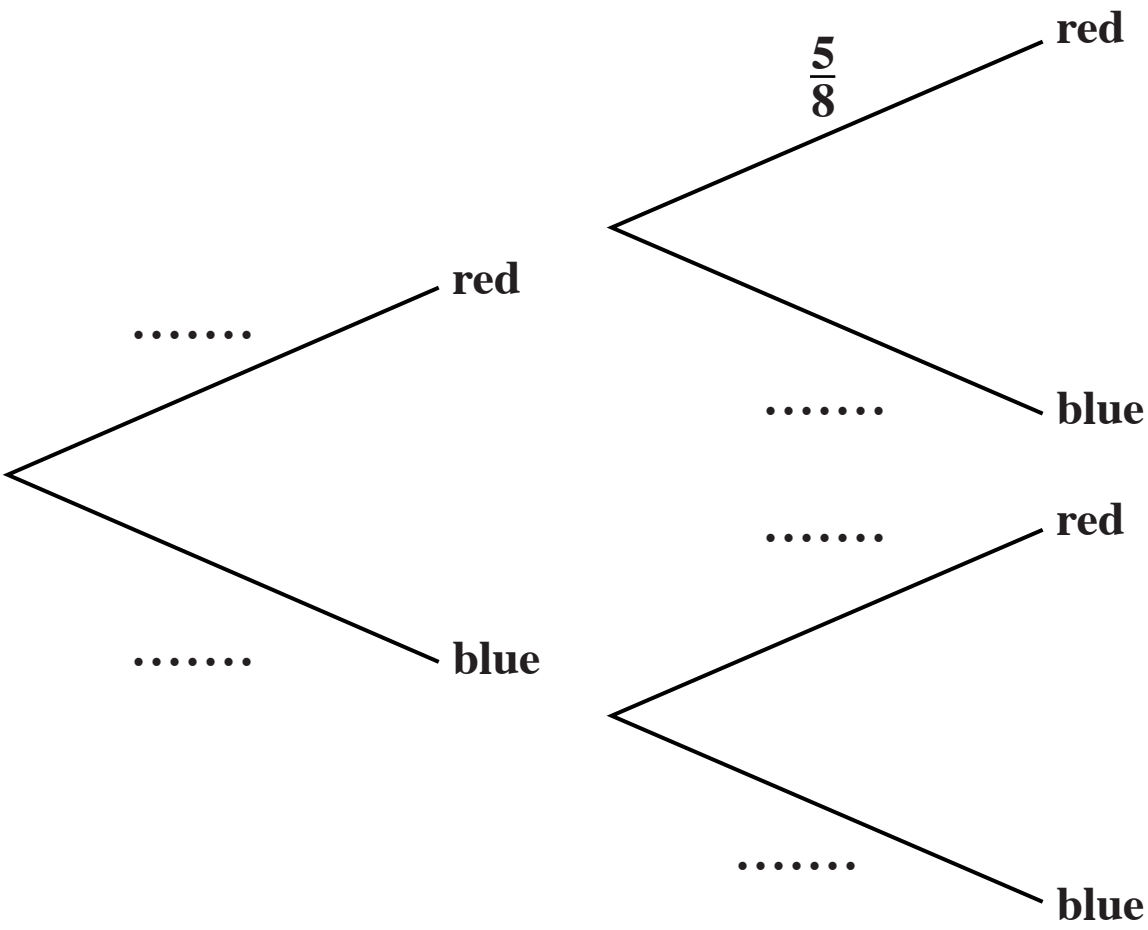
$3\frac{1}{4} \times 1\frac{1}{3}$

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

_____

4 A bag contains 8 counters, of which 5 are red and 3 are blue.
Umar picks a counter at random and then replaces it.
Umar then picks a second counter at random.

(a) Complete the tree diagram.
[2 marks]



(b) Work out the probability that Umar picks one counter of each colour.
[3 marks]

(b) _____

5 Craig has completed some algebra homework.
In each of his answers, he has made a mistake.

Explain his mistake in each case.

QUESTION (a)

Expand $x(x + 3)$.

CRAIG'S ANSWER

$x(x + 3) = 2x + 3x = 5x$

Mistake is _____

_____

[1 mark]

QUESTION (b)

Expand $(x - 3)(x + 4)$.

CRAIG'S ANSWER

$(x - 3)(x + 4) = x^2 - 12$

Mistake is _____

_____

[1 mark]

QUESTION (c)

Factorise $x^2 - 36$.

CRAIG'S ANSWER

$x^2 - 36 = (x - 6)(x - 6)$

Mistake is _____

_____

[1 mark]

6 (a) Solve.

$x^2 - 5x - 14 = 0$

[3 marks]

(a) _____

(b) Rearrange this formula to make p the subject.

$m = \sqrt{\frac{p}{7}}$

[2 marks]

(b) _____

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