

Candidate forename						Candidate surname					
Centre number						Candidate number					

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS
GENERAL CERTIFICATE OF SECONDARY EDUCATION**

B279B

MATHEMATICS C

(GRADUATED ASSESSMENT)

MODULE M9 – SECTION B

THURSDAY 20 JANUARY 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)

Scientific or graphical calculator

READ INSTRUCTIONS OVERLEAF

INSTRUCTIONS TO CANDIDATES

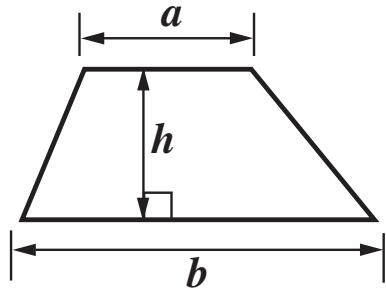
- Write your name, centre number and candidate number in the boxes on the first page. Please write clearly and in capital letters.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Show 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.

INFORMATION FOR CANDIDATES

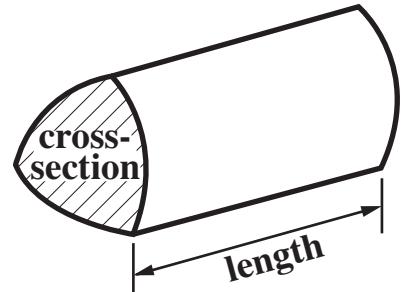
- The number of marks is given in brackets [] at the end of each question or part question.
- Section B starts with question 7.
- You are expected to use a calculator in Section B of this paper.
- Use the π button on your calculator or take π to be 3.142 unless the question says otherwise.
- The total number of marks for this Section is 25.

FORMULAE SHEET

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



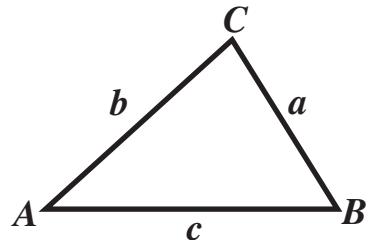
Volume of prism = (area of cross-section) \times length



In any triangle ABC

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

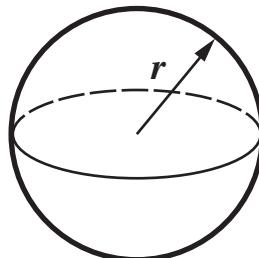
Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$



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

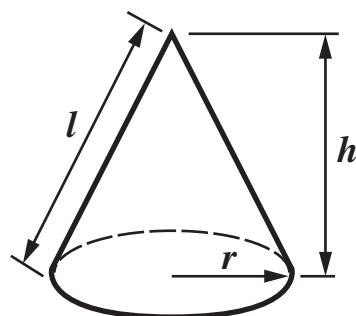
Volume of sphere = $\frac{4}{3}\pi r^3$

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



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

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

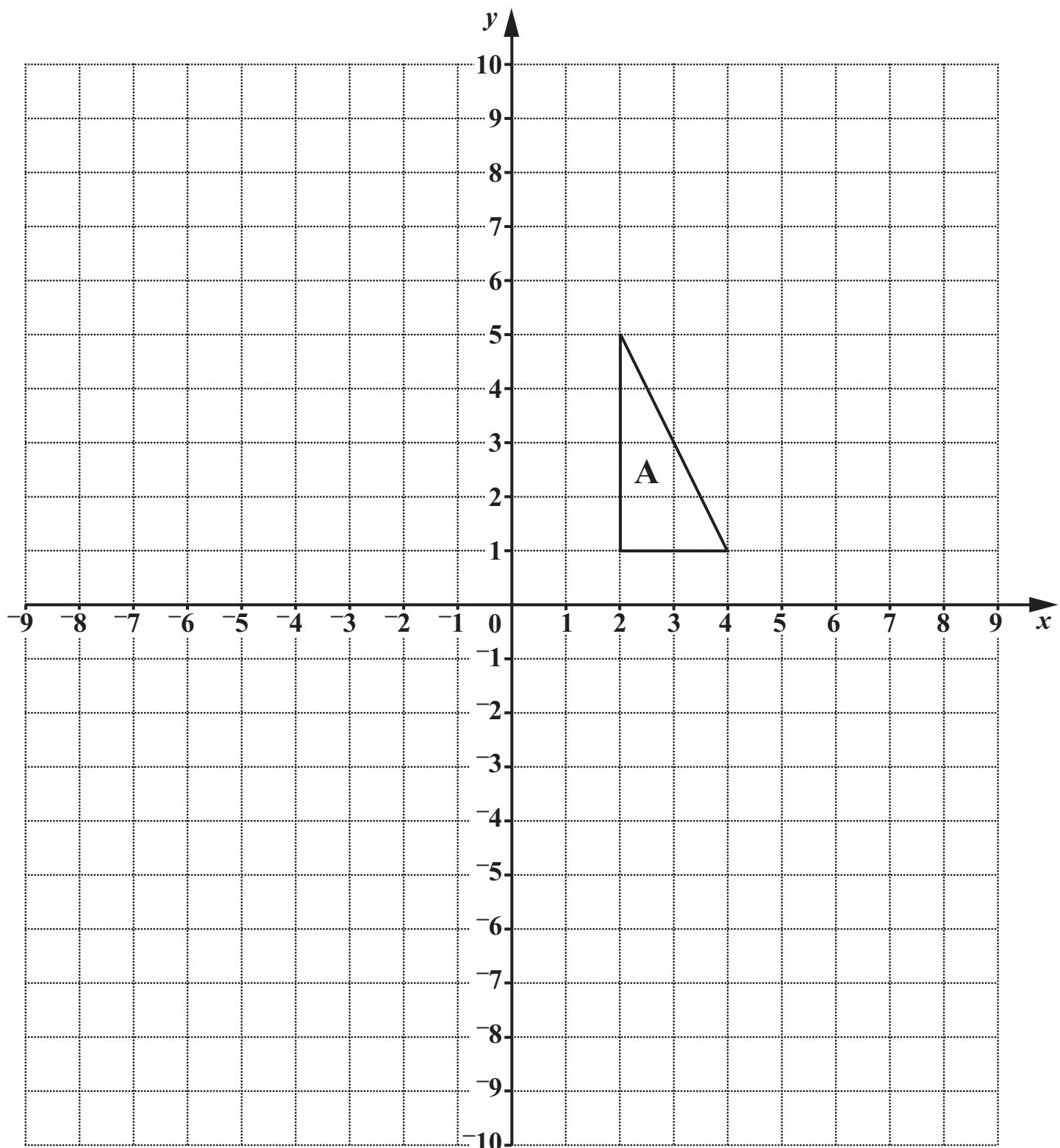


The Quadratic Equation

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

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

- 7 Triangle A is drawn on a coordinate grid.

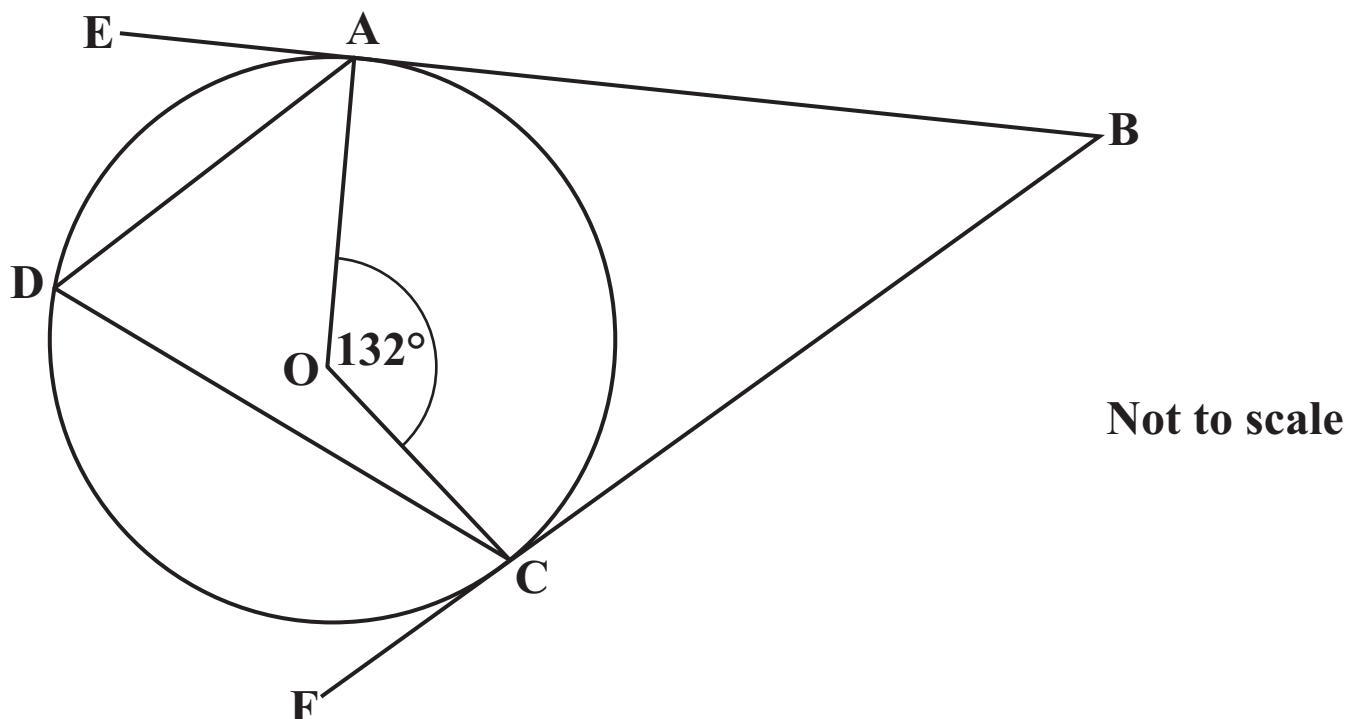


**(a) Enlarge triangle A with centre $(0, 0)$ and scale factor -2 .
Label the image B.** [2]

**(b) Write down the scale factor of the enlargement that
maps triangle B onto triangle A.**

(b) _____ [1]

- 8 A, D and C are points on a circle, centre O.
BAE and BCF are tangents to the circle.
Angle AOC = 132° .



- (a) Find the size of angle ADC, giving your reason.

Angle ADC = _____ $^\circ$ because _____

[2]

- (b) Find the size of angle ABC, giving your reasons.

Angle ABC = _____ $^\circ$ because _____

[3]

- 9 A rectangular rug measures 185 cm by 120 cm, each correct to the nearest centimetre.**

Calculate the upper bound of the area of the rug.

_____ cm² [2]

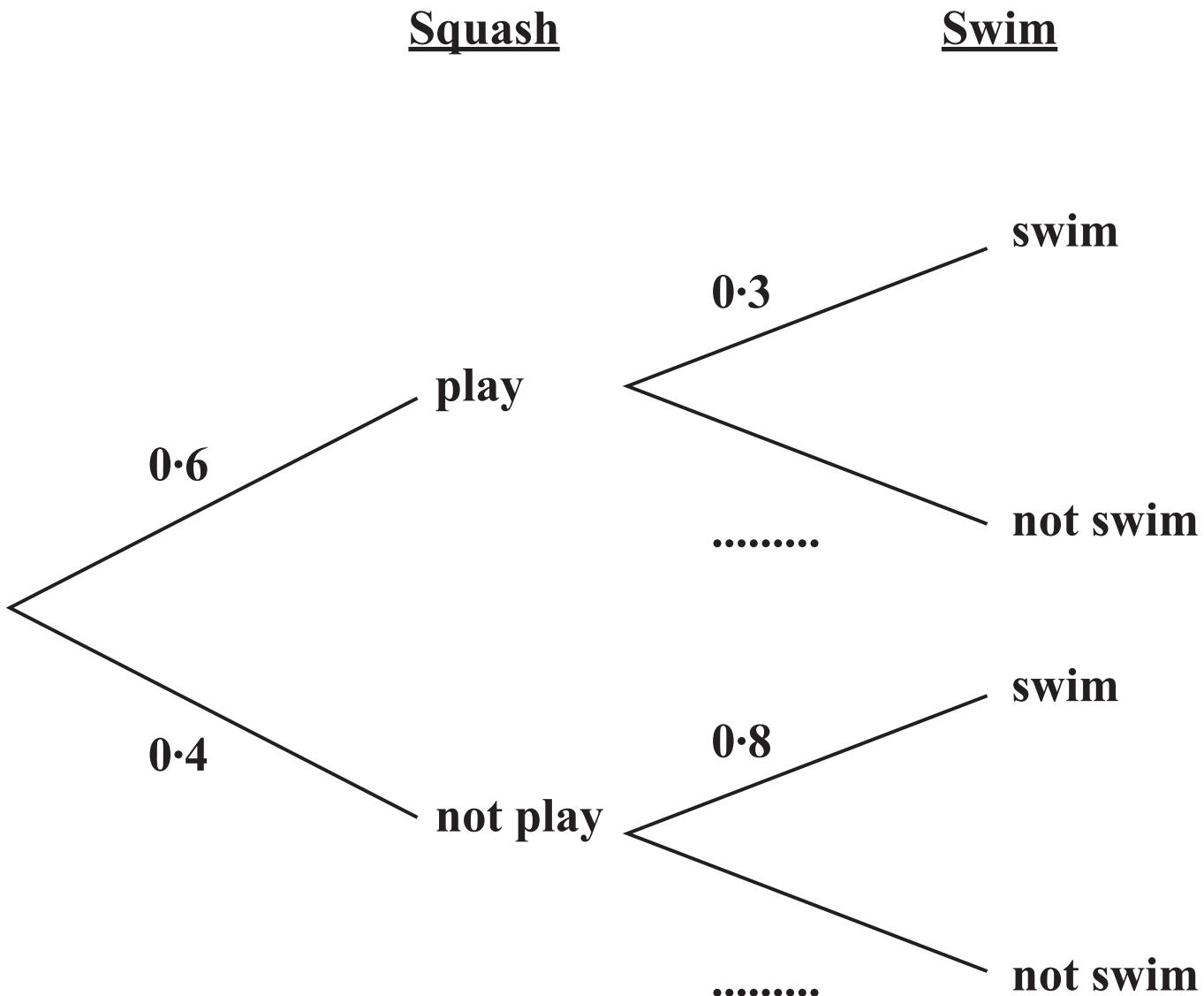
10 Rearrange

$$6a + 5c = ac + 9$$

to make a the subject.

[3]

- 11 (a) Every Saturday, Peter goes to the sports centre. Sometimes he plays squash, sometimes he swims, sometimes he does both, sometimes he doesn't do either. This tree diagram shows the probabilities of Peter playing squash and/or swimming.



- (i) Complete the tree diagram.

[1]

(ii) Calculate the probability that Peter does at least one of these two sports on a Saturday.

(a)(ii) _____ [3]

- (b) Shona wants to find out what sports the students from her school do on Saturdays.
She wants to choose a representative stratified sample of 50 students.
This table shows how many students are in each year group.

Year group	Number of students
7	66
8	84
9	90
10	82
11	78
Total	400

How many students in the sample should be from year 7?

Show how you decide.

(b) _____ [2]

TURN OVER FOR QUESTION 12

- 12 (a)** A child has two wooden bricks which are mathematically similar.
One brick is twice as long as the other.
The smaller brick has volume 12 cm^3 .

What is the volume of the larger brick?

(a) _____ cm^3 [2]

- (b)** A child's foam ball is a sphere of radius 5·2 cm.
The density of the foam is 0·045 g/cm³.

Calculate the mass of the ball.

Give your answer to an appropriate degree of accuracy.

(b) _____ g [4]

BLANK PAGE

BLANK 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.