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

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)
Scientific or graphical calculator

READ INSTRUCTIONS OVERLEAF

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INSTRUCTIONS TO CANDIDATES

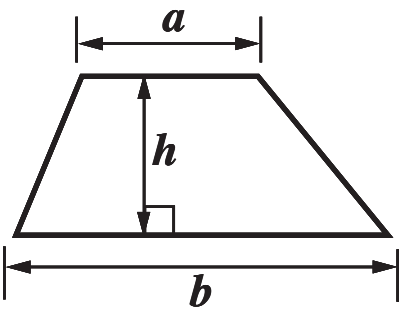
- **Write your name, centre number and candidate number in the boxes on the first page. Please write clearly and in capital letters.**
- **Use black ink. Pencil may be used for graphs and diagrams only.**
- **Read each question carefully. Make sure you know what you have to do before starting your answer.**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

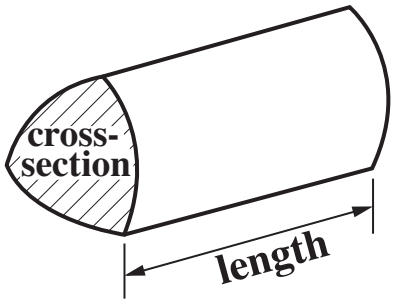
- **The number of marks is given in brackets [ ] at the end of each question or part question.**
- **Section B starts with question 7.**
- **You are expected to use a calculator in Section B of this paper.**
- **Use the π button on your calculator or take π to be 3·142 unless the question says otherwise.**
- **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) × length

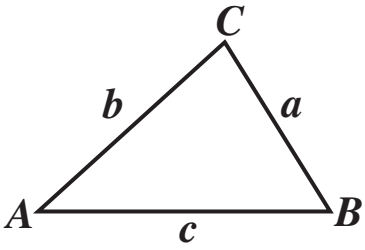


In any triangle ABC

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

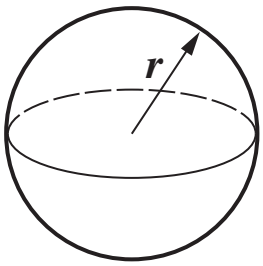
Cosine rule $a^2 = b^2 + c^2 - 2bc\cos A$

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



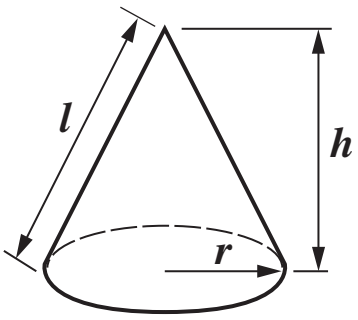
Volume of sphere $= \frac{4}{3}\pi r^3$

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



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

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



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 The momentum, I, of a moving object is given by this formula.

$$I = m \times v$$

- **I is the momentum in Newton seconds**
- **m is the mass in kilograms**
- **v is the velocity in metres per second**

An object has a mass of 8·6 kg and a velocity of 12·8 metres per second.
Both measurements are given correct to one decimal place.

Calculate the LOWER BOUND of the momentum of the object. [2 marks]

_____ Newton seconds

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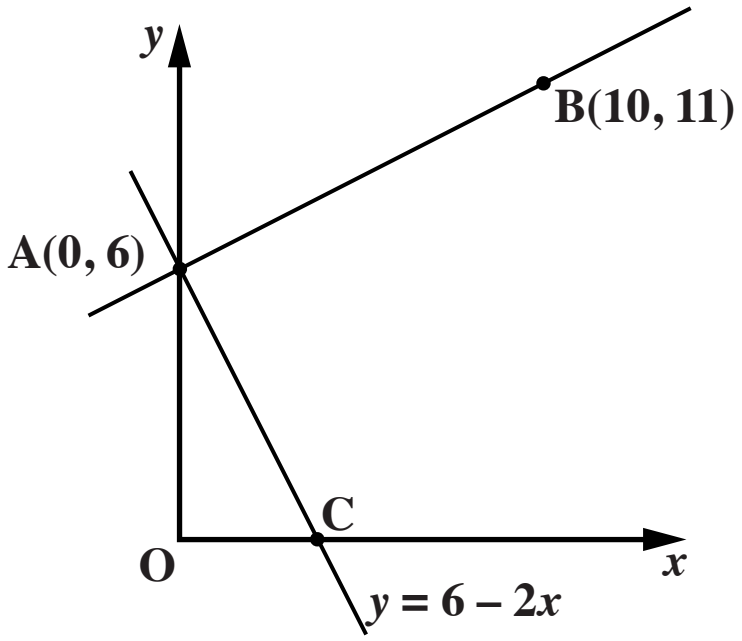
8 Use the diagram below to answer the questions that follow.



Not to scale

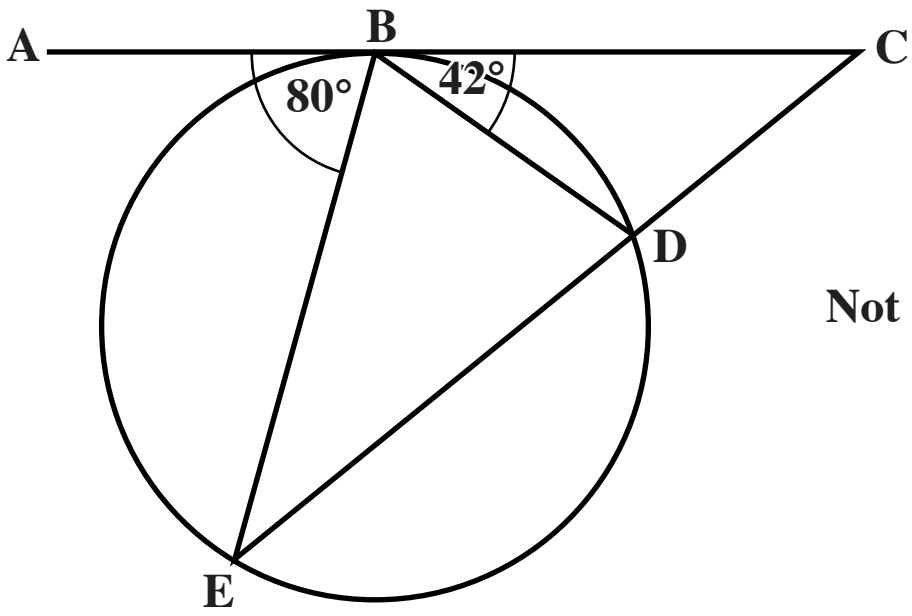
(a) Calculate the length AB. [3 marks]

(a) _____

(b) The equation of the line AC is $y = 6 - 2x$.

Show that the line AB is perpendicular to line AC.
[3 marks]

9 Use the diagram below to answer the questions that follow.



Not to scale

B, D and E are points on a circle.
EDC is a straight line.
ABC is the tangent to the circle at B.
Angle ABE = 80° and angle CBD = 42°.

Find angle BCD.
Give a reason for each step of your answer. [4 marks]

10 The headteacher of a school wants to set up an after-school club for Year 7 students.
He wants to find out whether the way they travel to school will affect their decision to attend.
This table shows how all the students from Year 7 travel to school.

Walk	Bus	Car
68	119	13

He decides to sample the views of 40 students from Year 7 by taking a representative stratified sample.

How many of the students who travel to school by bus should be in the sample? [2 marks]

_____

11 The table shows the values of two variables x and y.

x	1·2	2	2·8
y	3·6	10	19·6

(a) Show that y is directly proportional to the square of x. [3 marks]

_____

_____

_____

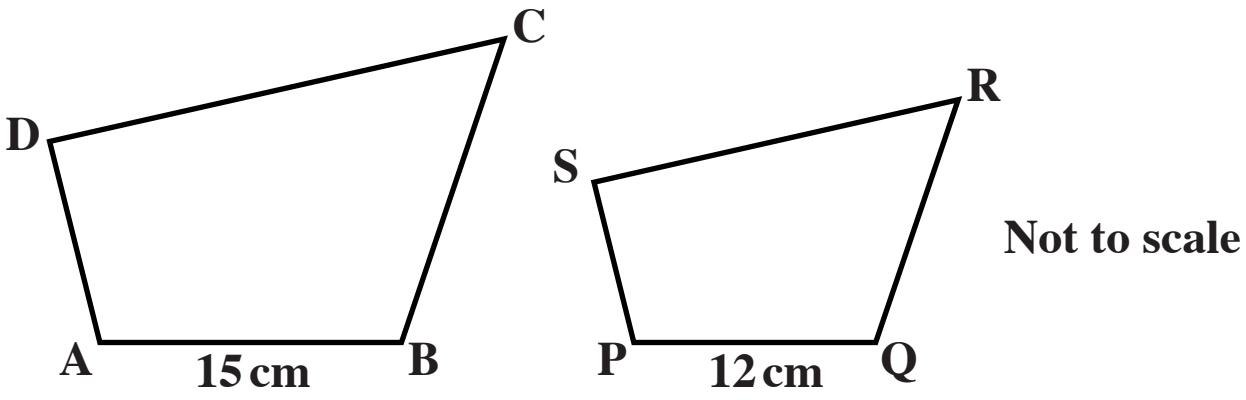
_____

_____

(b) Calculate y when $x = 2·4$. [1 mark]

(b) _____

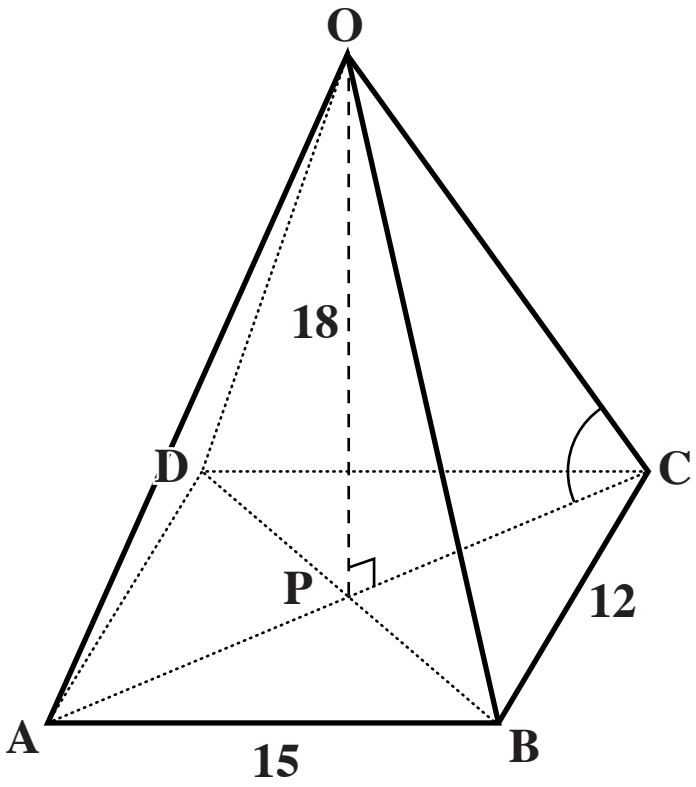
12 The two quadrilaterals, ABCD and PQRS, are similar. The area of ABCD is 97·5 cm^2.



Calculate the area of PQRS. [3 marks]

_____ cm^2

13 OABCD is a rectangular based pyramid.



The vertex O is vertically above P, the centre of the base.
AB = 15 cm, BC = 12 cm, OP = 18 cm.

Show that angle OCP = 61·9°, correct to one decimal place.
[4 marks]

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