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Centre Number						Candidate Number				
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**OXFORD CAMBRIDGE AND RSA EXAMINATIONS
GENERAL CERTIFICATE OF SECONDARY EDUCATION**

B282B

**MATHEMATICS C
(GRADUATED ASSESSMENT)**

Terminal Paper – Section B (Higher Tier)

MONDAY 1 JUNE 2009: Morning

DURATION: 1 hour

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

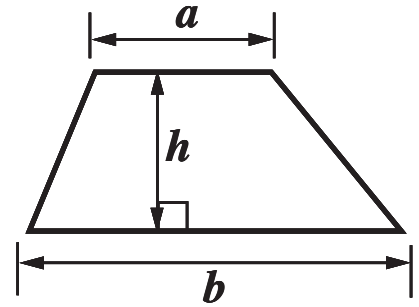
- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes on the first page.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Show your 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

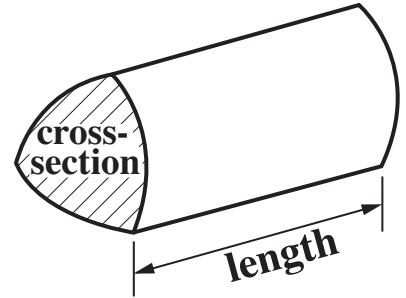
- The number of marks is given in brackets [] at the end of each question or part question.
- Section B starts with question 11.
- You are expected to use a calculator in Section B of this paper.
- Use the π button on your calculator or take π to be 3.142 unless the question says otherwise.
- The total number of marks for this Section is 50.

Formulae Sheet

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

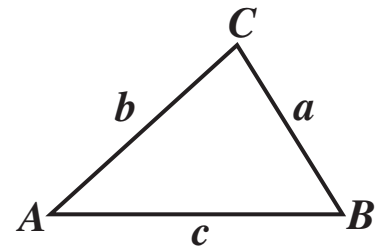


Volume of prism = (area of cross-section) \times length



In any triangle ABC

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

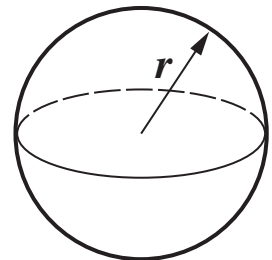


Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$

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

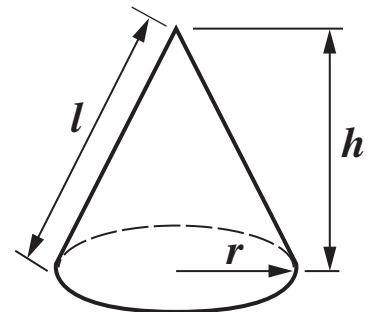
Volume of sphere = $\frac{4}{3}\pi r^3$

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



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

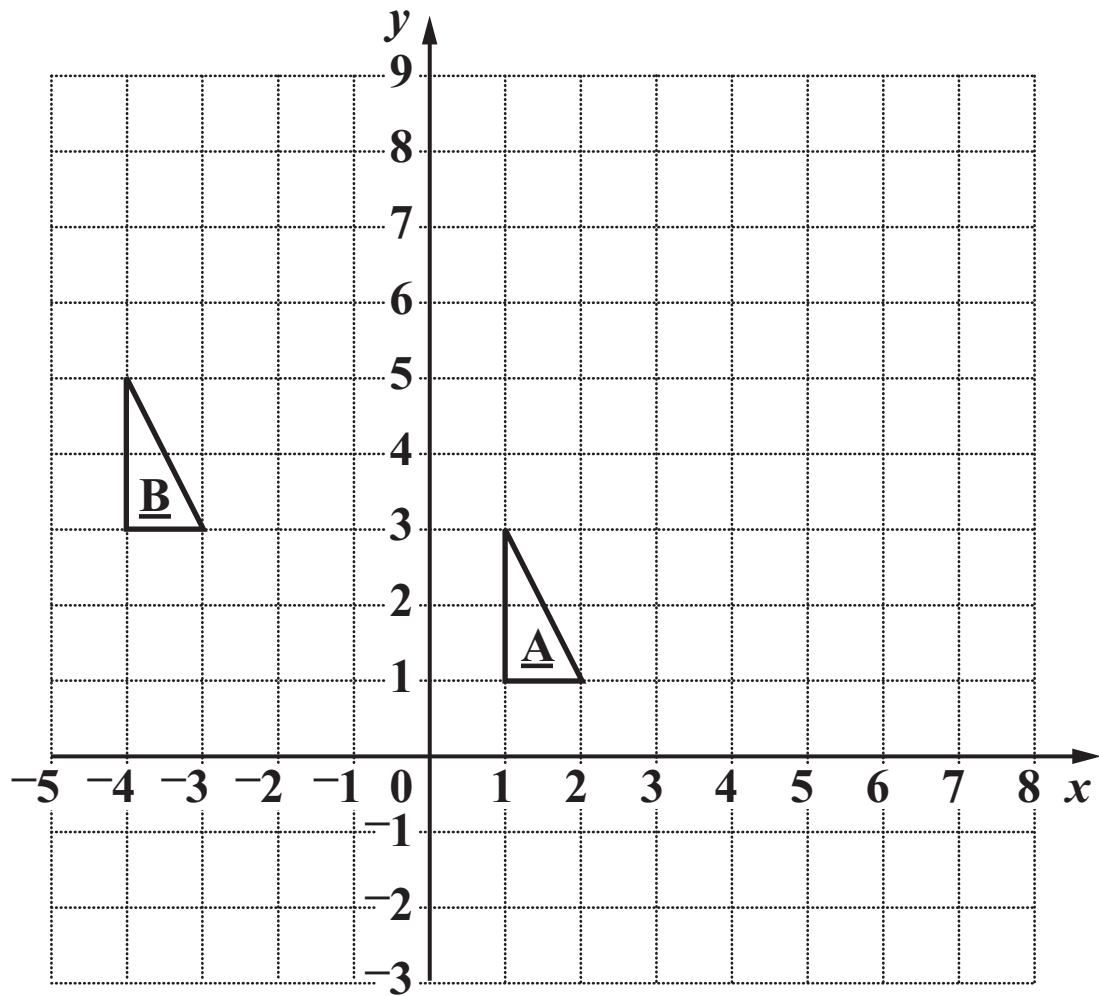
Curved surface area of cone = $\pi r l$



The Quadratic Equation

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

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



- (a) Enlarge triangle A with centre $(0, 2)$ and scale factor 3.
[3 marks]
- (b) Write down the column vector of the translation which maps triangle A onto triangle B.

[1 mark]

(b) $\begin{pmatrix} \text{---} \\ \text{---} \end{pmatrix}$

- 12 Ana did a survey for the local optician.
She asked 100 people whether or not they wore glasses.
This table shows her results.**

	Wear glasses	Not wear glasses	Total
Male		32	60
Female	15		40
Total	43		100

- (a) Complete the table.
[1 mark]**

- (b) One of the 100 people is chosen at random.
What is the probability that this person does not wear glasses?**

(b) _____

[1 mark]

- (c) One of the females is chosen at random.
What is the probability that she wears glasses?**

(c) _____

[1 mark]

(d) In the survey, Ana wanted to find out how long each day people wore their glasses.

Write a suitable question she could ask, with response boxes for people to tick.

[2 marks]

13 Calculate.

$$\frac{17 \times 89}{5.16 \times 0.72}$$

Give your answer correct to 2 decimal places.

[2 marks]

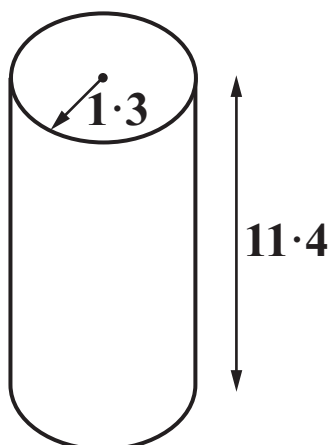
14 The equation $x^3 - 8x + 6 = 0$ has a solution between $x = 2$ and $x = 3$.

Use trial and improvement to find this solution correct to 1 decimal place.

Show all your trials and the values of their outcomes.

[3 marks]

- 15** A child's wooden building block is a cylinder.
Its radius is 1.3 cm and its height is 11.4 cm.
Its mass is 45 g.



Calculate the density of the wood, in grams per cubic centimetre.

**Give your answer to an appropriate degree of accuracy.
Show your method clearly.**

[6 marks]

_____ g/cm^3

**16 (a) In a Bank Holiday Sale, a computer shop reduced its price for a printer by 12%.
The normal price was £70.**

Calculate the sale price.

[3 marks]

(a) £ _____

**(b) In the sale, the price of a computer was reduced by 20%.
Its sale price was £492.**

Calculate its normal price.

[3 marks]

(b) £ _____

17 (a) Peter investigated how many people were living in each house in his road.

This table summarises his results.

Number of people in house	Frequency
1	3
2	7
3	4
4	6
5	6
6	3
7	1

Calculate the mean number of people living in a house in Peter's road.

[3 marks]

(a) _____

(b) The estimated populations of India and Russia in July 2007 are shown below.

- **India** 1.13×10^9
- **Russia** 1.41×10^8

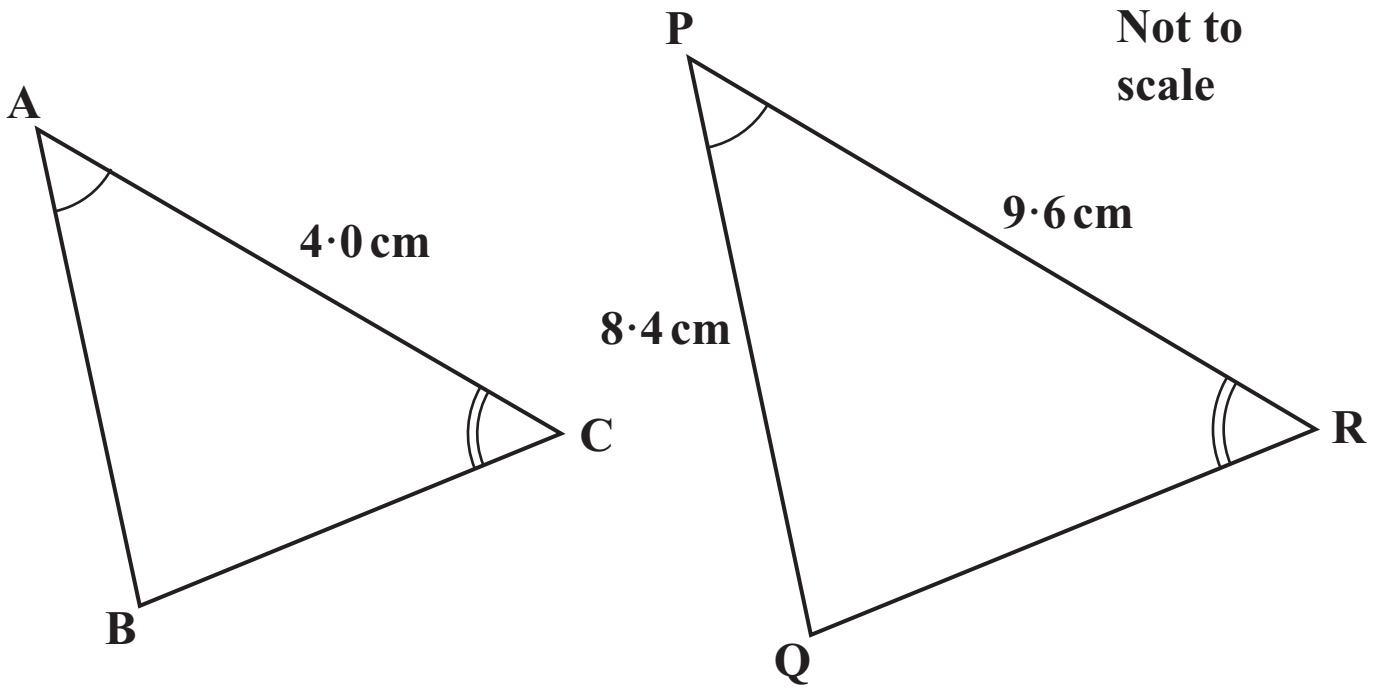
**Calculate the difference between these populations.
Give your answer in standard form.**

[2 marks]

(b) _____

18 Triangles ABC and PQR are similar, as shown.

Calculate AB.



[3 marks]

_____ cm

19 Find the value of t for which $5 \times 0.2^t = 6.4 \times 10^{-5}$.

[2 marks]



20 (a) Solve.

$$3y + 2 > 5y - 1$$

[2 marks]

(a) _____

(b) Make p the subject of this formula.

$$C = 2p^2$$

[2 marks]

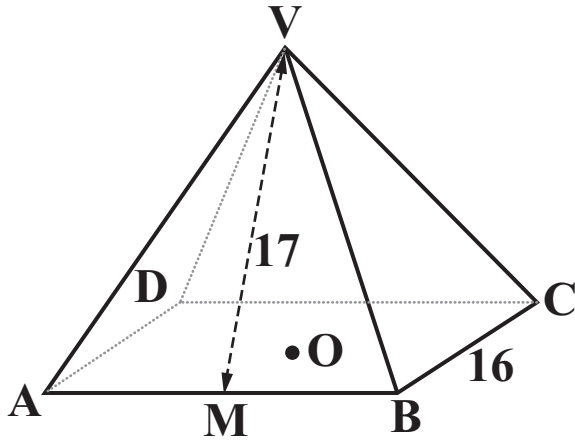
(b) _____

(c) Express $x^2 - 8x + 5$ in the form $(x - a)^2 + b$.

[3 marks]

(c) _____

- 21 $VABCD$ is a pyramid.
Its base $ABCD$ is a square of side 16 cm .
 O is the centre of the base.
All the sloping edges are equal.
 M is the midpoint of AB and VM is 17 cm .



- (a) Show clearly that the perpendicular height, VO , of the pyramid is 15 cm .

[2 marks]

(b) Calculate the volume of the pyramid.

[2 marks]

(b) _____ **cm³**

(c) Calculate the angle between VM and the base of the pyramid.

[3 marks]

(c) _____ **°**



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