

Candidate forename		Candidate surname	
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Centre number						Candidate number				
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**OXFORD CAMBRIDGE AND RSA EXAMINATIONS  
GENERAL CERTIFICATE OF SECONDARY EDUCATION**

**B279A**

**MATHEMATICS C  
(GRADUATED ASSESSMENT)**

**MODULE M9 (SECTION A)**

**TUESDAY 21 JUNE 2011: 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**

## **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.**
- **The total number of marks for this Section is 25.**

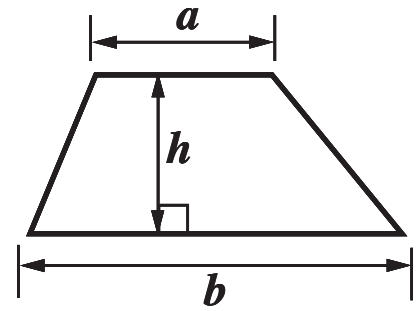


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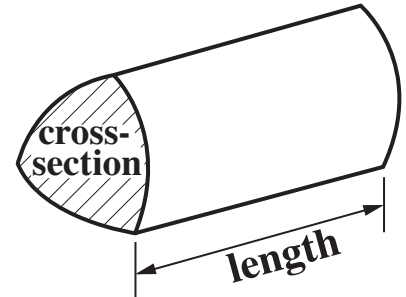
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# FORMULAE SHEET

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



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

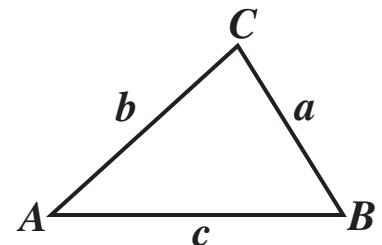


**In any triangle ABC**

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

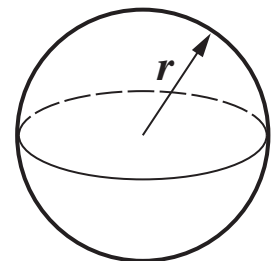
**Cosine rule**  $a^2 = b^2 + c^2 - 2bc \cos A$

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



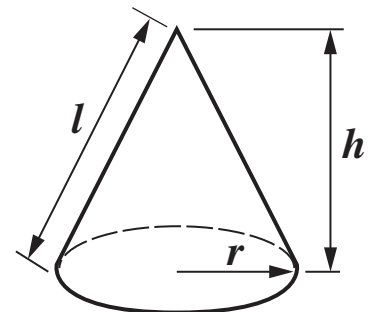
**Volume of sphere** =  $\frac{4}{3}\pi r^3$

**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

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

**1 Work out.**

**(a)  $64^0$**

**(a) \_\_\_\_\_ [1]**

**(b)  $6^{-2}$**

**(b) \_\_\_\_\_ [1]**

**(c)  $16^{\frac{3}{4}}$**

**(c) \_\_\_\_\_ [2]**

**2 Rearrange this formula to make  $r$  the subject.**

$$V = \frac{2}{3}\pi r^3$$

\_\_\_\_\_ [3]

**3 Estimate.**

$$4.093 \times 10^5 \times 7.971 \times 10^{11}$$

**Give your answer in standard form.**

\_\_\_\_\_ [2]

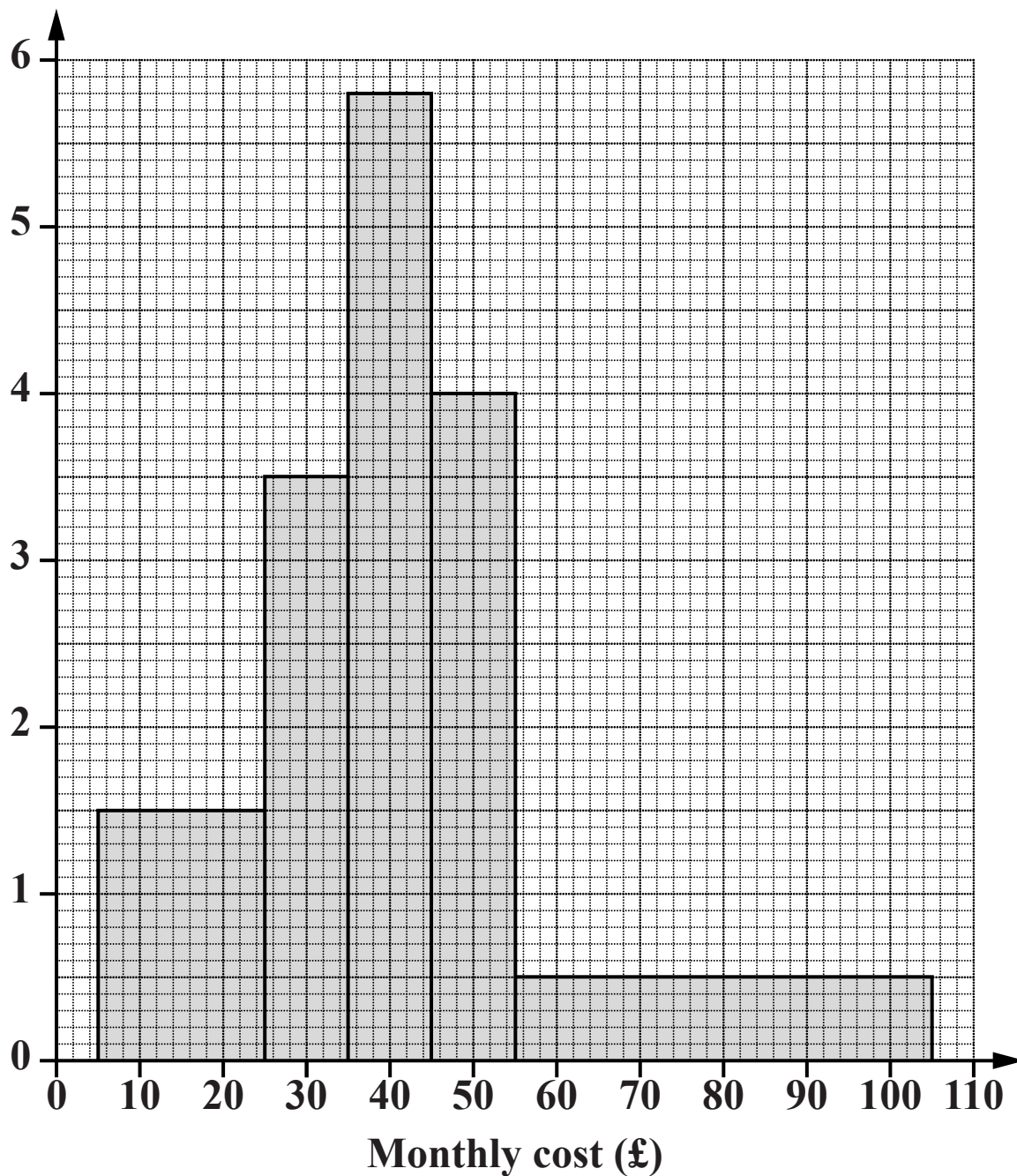
- 4 Andrew weighs 66 kg, correct to the nearest kilogram.  
Harris weighs 64.3 kg, correct to the nearest 0.1 kg.**

**Calculate the upper bound of the difference in the boys' weights.**

\_\_\_\_\_ kg [3]

- 5 The histogram shows the distribution of monthly costs of mobile phones for a sample of people.

Frequency density (people per £)

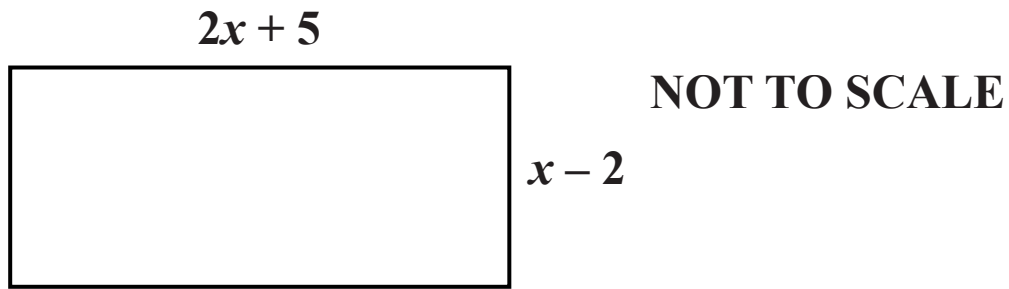




**How many people were in the sample altogether?**

\_\_\_\_\_ [3]

- 6 The diagram shows a rectangle.  
All lengths in the diagram are in metres.



The area of the rectangle is  $18 \text{ m}^2$ .

- (a) Show that  $2x^2 + x - 28 = 0$ . [3]

**(b) (i) Solve the equation  $2x^2 + x - 28 = 0$  by factorising.**

**(b)(i) \_\_\_\_\_ [3]**

**(ii) State the length and width of the rectangle.**

**(ii) \_\_\_\_\_ m and \_\_\_\_\_ m [1]**

**7 A has coordinates (0, 5) and B has coordinates (3, -1).**

**(a) Show that the gradient of the line AB is  $-2$ . [1]**

**(b) Find the equation of the line perpendicular to AB that passes through A.**

**Give your answer in the form  $y = mx + c$ .**

**(b) \_\_\_\_\_ [2]**