

**GENERAL CERTIFICATE OF SECONDARY EDUCATION
MATHEMATICS C (GRADUATED ASSESSMENT)
MODULE M9 – SECTION A**

B279A

Candidates answer on the Question Paper

OCR Supplied Materials:

None

Other Materials Required:

- Geometrical instruments
- Tracing paper (optional)

**Monday 8 March 2010
Morning**

Duration: 30 minutes



Candidate Forename		Candidate Surname	
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Centre Number						Candidate Number				
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INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- 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.
- Do **not** write in the bar codes.
- 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**.
- This document consists of **8** pages. Any blank pages are indicated.

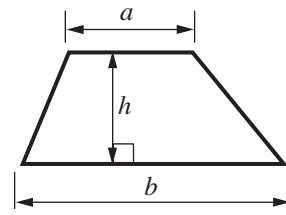
WARNING



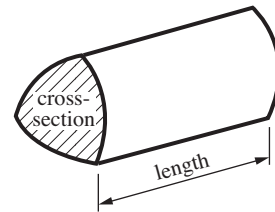
No calculator can be used for Section A of this paper

Formulae Sheet

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



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

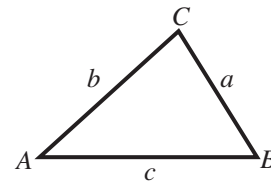


In any triangle ABC

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

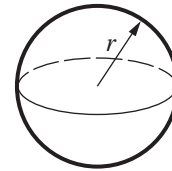
Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$

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



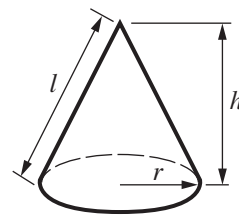
Volume of sphere = $\frac{4}{3}\pi r^3$

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

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

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1 Evaluate.

(a) 6^0

(a) [1]

(b) $27^{\frac{2}{3}}$

(b) [2]

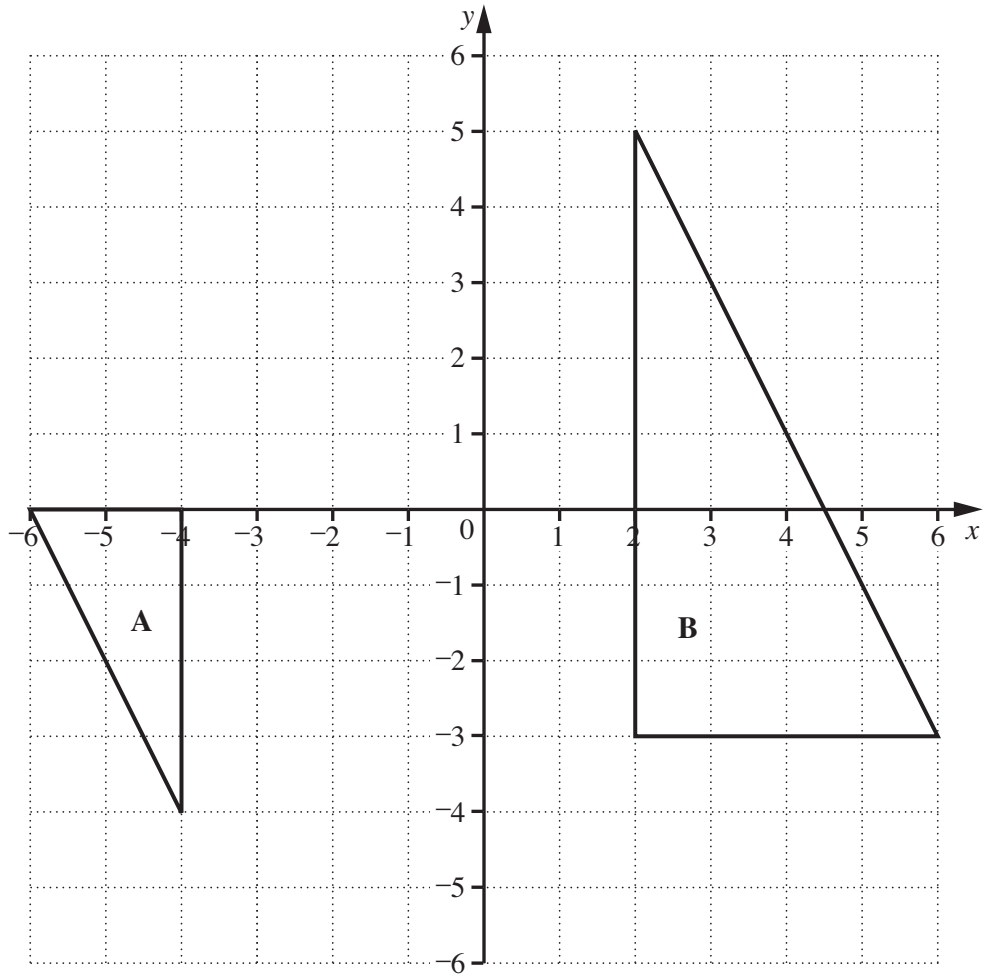
2 In 2007, the average carbon footprint per household per year in the UK was 2.96×10^4 kg of carbon dioxide.

The number of households in the UK in 2007 was 25.1 million.

Estimate the total carbon footprint for all of the households in the UK for the year 2007.
Give your answer in standard form.

..... kg [3]

3



Describe fully the **single** transformation which maps triangle **A** onto triangle **B**.

.....

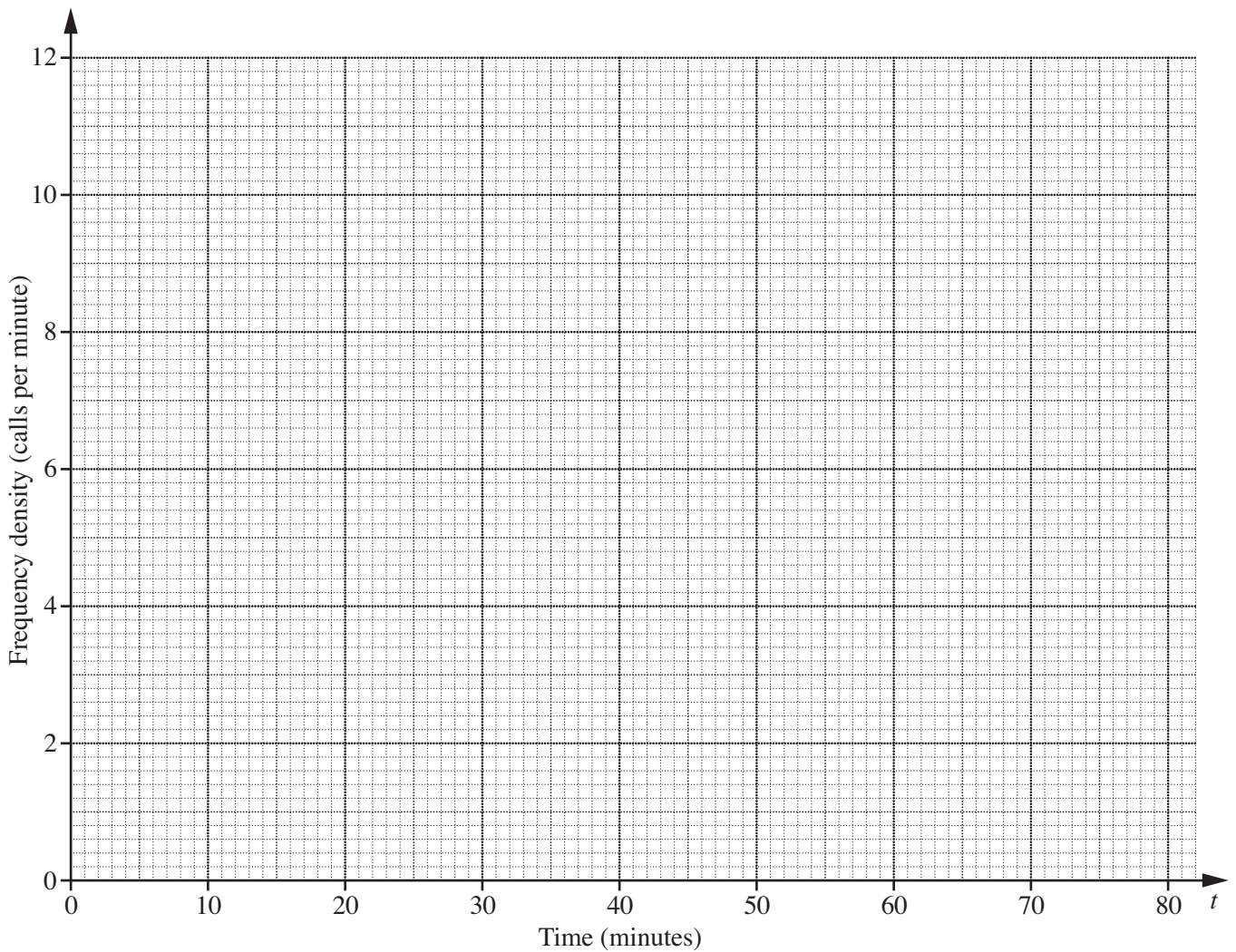
.....

..... [3]

- 4 This table shows the distribution of times, t minutes, for the length of telephone calls in a household over a 3 month period.

Time (t minutes)	Frequency
$0 < t \leq 10$	120
$10 < t \leq 30$	180
$30 < t \leq 50$	130
$50 < t \leq 80$	75

- (a) Draw a histogram to illustrate these data.



[3]

- (b) Sanjay says:

The length of the longest telephone call in this household was 80 minutes.

Is he definitely correct?

Give a reason for your answer.

.....
 [1]

5 (a) Expand and simplify.

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

(a) [3]

(b) Solve by factorising.

$$5x^2 - 12x + 7 = 0$$

(b) [3]

- 6 (a) P is the point $(-2, 5)$ and Q is the point $(3, 17)$.

Calculate the length PQ.

(a) [3]

- (b) Find the equation of the straight line which passes through the point $(0, 5)$ and is perpendicular to the line $y = 4x + 1$.

(b) [3]

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