OCR
RECOGNISING ACHIEVEMENT

GENERAL CERTIFICATE OF SECONDARY EDUCATION
MATHEMATICS C (GRADUATED ASSESSMENT)

M8 B248A

MODULE M8 – SECTION A

MONDAY 22 JANUARY 2007 Morning

Time: 30 minutes

Candidates answer on the question paper.
Additional materials: Geometrical instruments
Tracing paper (optional)

Candidate Name

Centre Number

Candidate Number

INSTRUCTIONS TO CANDIDATES

- Write your name, Centre Number and Candidate Number in the boxes above.
- Answer **all** the questions.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- In many questions marks will be given for a correct method even if the answer is incorrect.
- Do **not** write in the bar code.
- Do **not** write outside the box bordering each page.
- WRITE YOUR ANSWER TO EACH QUESTION IN THE SPACE PROVIDED. ANSWERS WRITTEN ELSEWHERE WILL NOT BE MARKED.

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.

WARNING
You are not allowed to use a calculator in Section A of this paper.

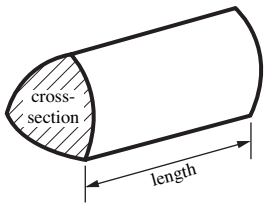
For Examiner's Use	
Section A	
Section B	
Total	

This document consists of **8** printed pages.

[Turn over

Formulae Sheet

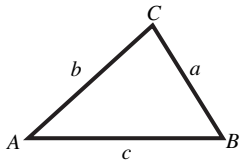
Volume of prism = (area of cross-section) × length



In any triangle *ABC*

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

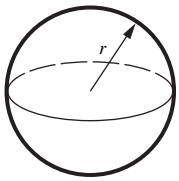
Cosine rule $a^2 = b^2 + c^2 - 2bc\cos A$



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

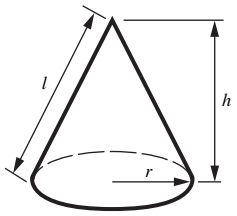
Volume of sphere = $\frac{4}{3}\pi r^3$

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



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

Curved surface area of cone = πrl



The Quadratic Equation

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

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

PLEASE DO NOT WRITE ON THIS PAGE

1 **(a)** Simplify.

$$a^4 \times a^3$$

(a) ..... [1]

(b) Rearrange this formula to make x the subject.

$$y = 7 + 4x$$

(b) ..... [2]

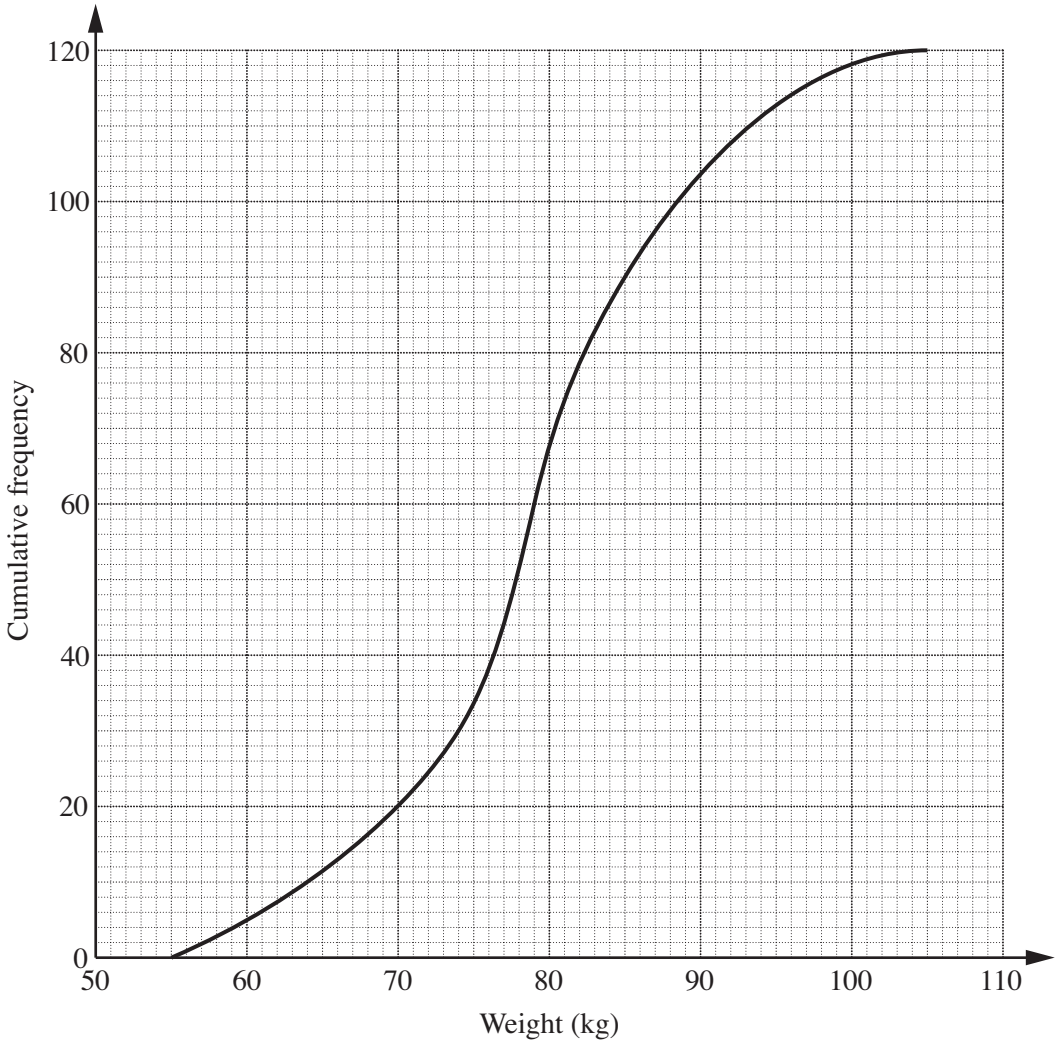
(c) Expand and simplify.

$$(x + 5)(x - 4)$$

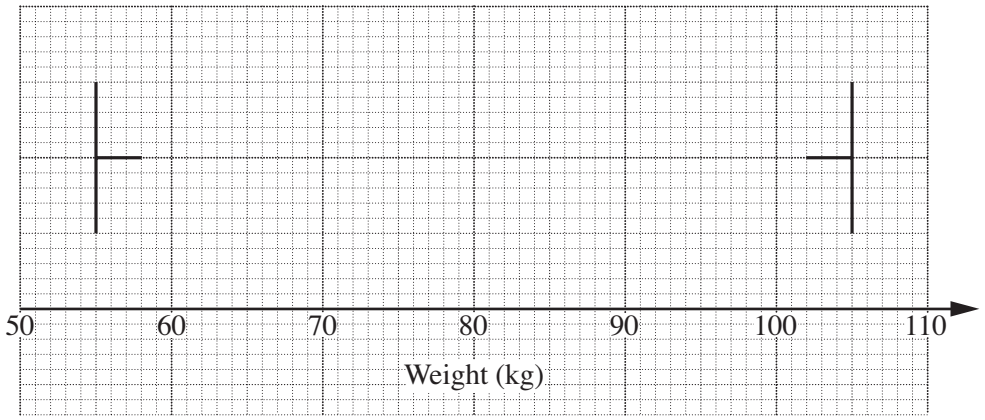
(c) ..... [2]

5

2 The weights of 120 students in year 11 of a school were recorded.
This cumulative frequency graph shows the distribution of their weights.



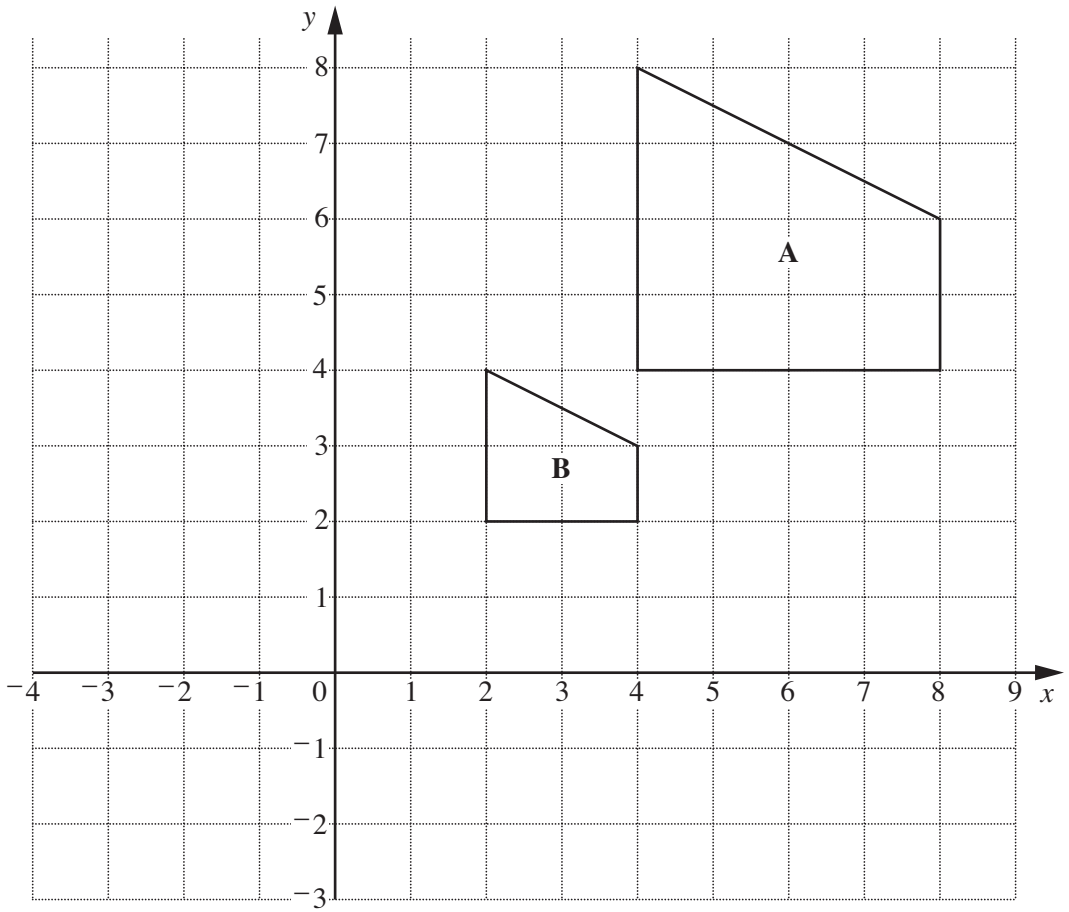
Complete the box plot to show this information.



[3]

3

3



(a) Translate shape **B** by $\begin{pmatrix} 4 \\ -3 \end{pmatrix}$.

Label the image **C**. [2]

(b) Describe fully the **single** transformation that maps shape **A** onto shape **B**.

.....

..... [3]

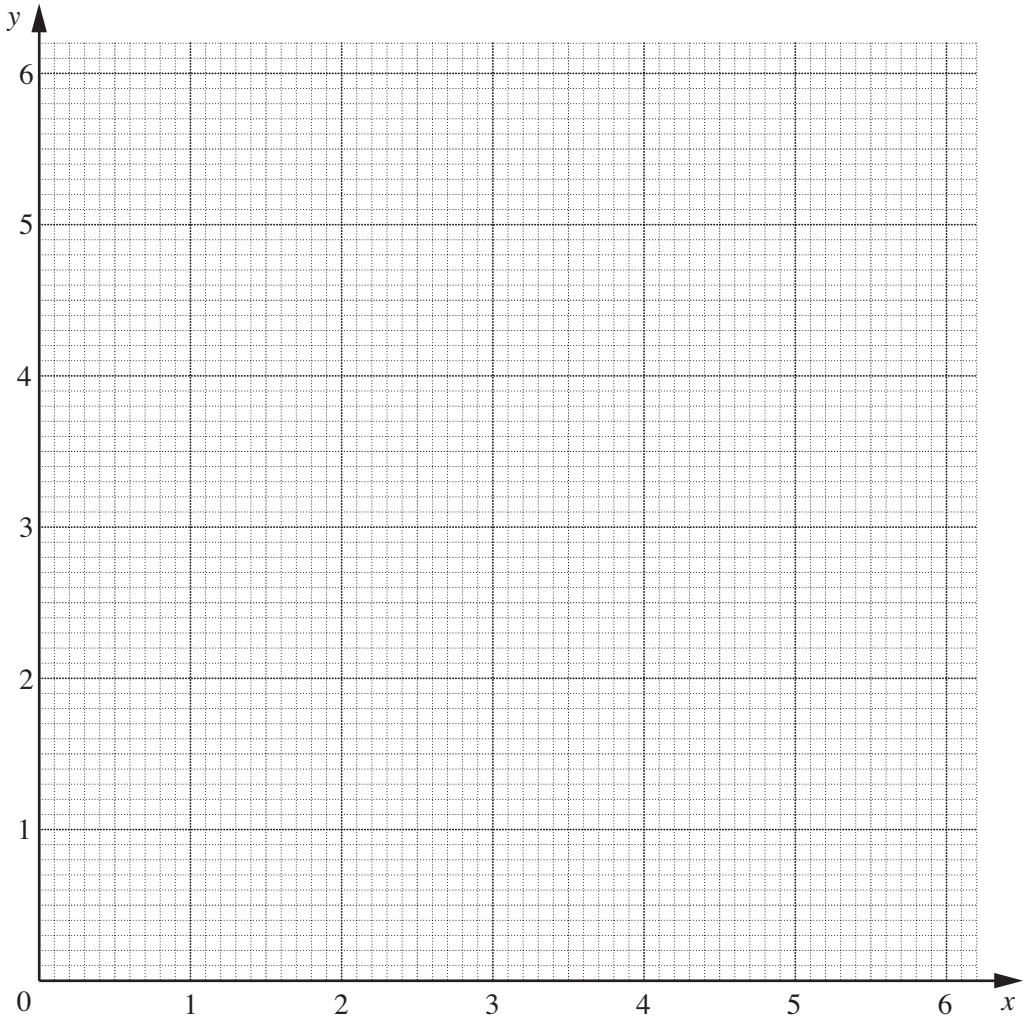
5

4 **(a)** Complete the table below for $y = \frac{6}{x}$.

x	1	2	3	4	5	6
y	6		2		1·2	1

[1]

(b) Draw the graph of $y = \frac{6}{x}$ on the grid below.



[2]

(c) Use your graph to solve the equation $\frac{6}{x} = 2{\cdot}2$.

(c) ..... [1]

4

5 In these expressions, a, b and c represent lengths.

$a(ab + bc)$ $\quad$ a^2b $\quad$ $c(a + b)$ $\quad$ $4(a + c)$

Which **one** of these expressions could represent an area?
Explain how you decide.

..... because .....

..... [2]

2

6 **(a)** Write 0·00027 in standard form.

(a) ..... [1]

(b) Evaluate.

$1{\cdot}7 \times 10^5 + 3{\cdot}4 \times 10^4$

Give your answer in standard form.

(b) ..... [2]

3

TURN OVER FOR QUESTION 7

7 Work out.

$$3\frac{3}{4} + 1\frac{2}{5}$$

Write your answer as a mixed number.

..... [3]

3