OCR
RECOGNISING ACHIEVEMENT

GENERAL CERTIFICATE OF SECONDARY EDUCATION
MATHEMATICS C (GRADUATED ASSESSMENT)

M8 B248B

MODULE M8 – SECTION B

MONDAY 22 JANUARY 2007

Morning

Time: 30 minutes

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

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

- You are expected to use a calculator in Section B of this paper.
- 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.
- Section B starts with question 8.
- Use the π button on your calculator or take π to be 3·142 unless the question says otherwise.

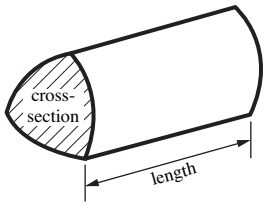
For Examiner's Use	
Section B	

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

[Turn over

Formulae Sheet

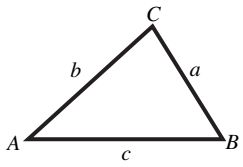
Volume of prism = (area of cross-section) × length



In any triangle *ABC*

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

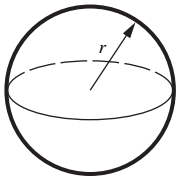
Cosine rule $a^2 = b^2 + c^2 - 2bc\cos A$



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

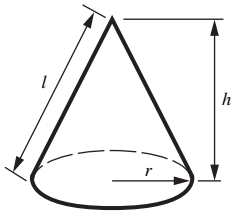
Volume of sphere = $\frac{4}{3}\pi r^3$

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



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

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



The Quadratic Equation

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

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

PLEASE DO NOT WRITE ON THIS PAGE

8 **(a)** Catherine bought her flat for £76 000.

She sold it for £110 200.

Calculate the percentage profit Catherine made.

(a) ..... % [3]

(b) Steve sold his flat for £113 400.

He made a profit of 35%.

Calculate how much Steve paid for his flat.

(b) £ ..... [3]

6

9 **(a)** Solve by factorising.

$$x^2 - 11x + 30 = 0$$

(a) ..... [3]

(b) Solve, algebraically, these simultaneous equations.

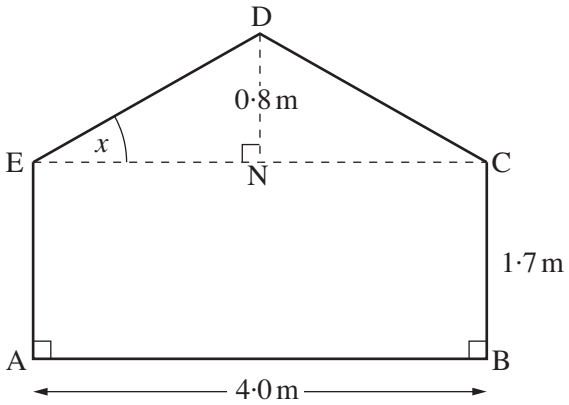
$$4x - 3y = 19$$
$$5x + 6y = 14$$

(b) $x =$ .....

$y =$ ..... [3]

6

10



Not to scale

The diagram shows the cross-section, ABCDE, of a greenhouse.

ABCE is a rectangle.
CDE is an isosceles triangle.

AB = 4·0 m, BC = 1·7 m and the height, DN, of the triangle is 0·8 m.

Calculate angle *x*.

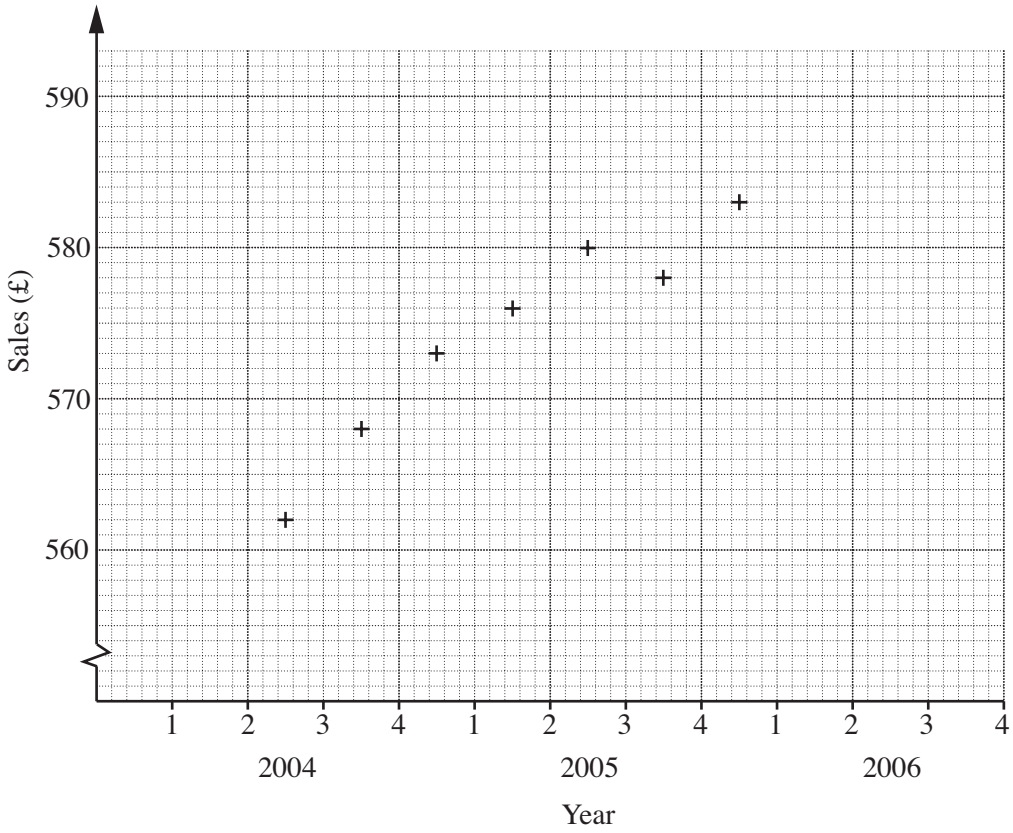
..... ° [3]

3

11 A small shop records the value of its sales of ice-cream each quarter.
The details of the last three years are shown in the table.

Year	2004				2005				2006			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4
Sales(£)	214	820	950	264	238	840	962	280	230	860	990	268

The first seven four-quarter moving averages have been plotted on the grid below.



(a) Calculate the final two four-quarter moving averages.
Plot them on the grid.

(a) ..... , ... [3]

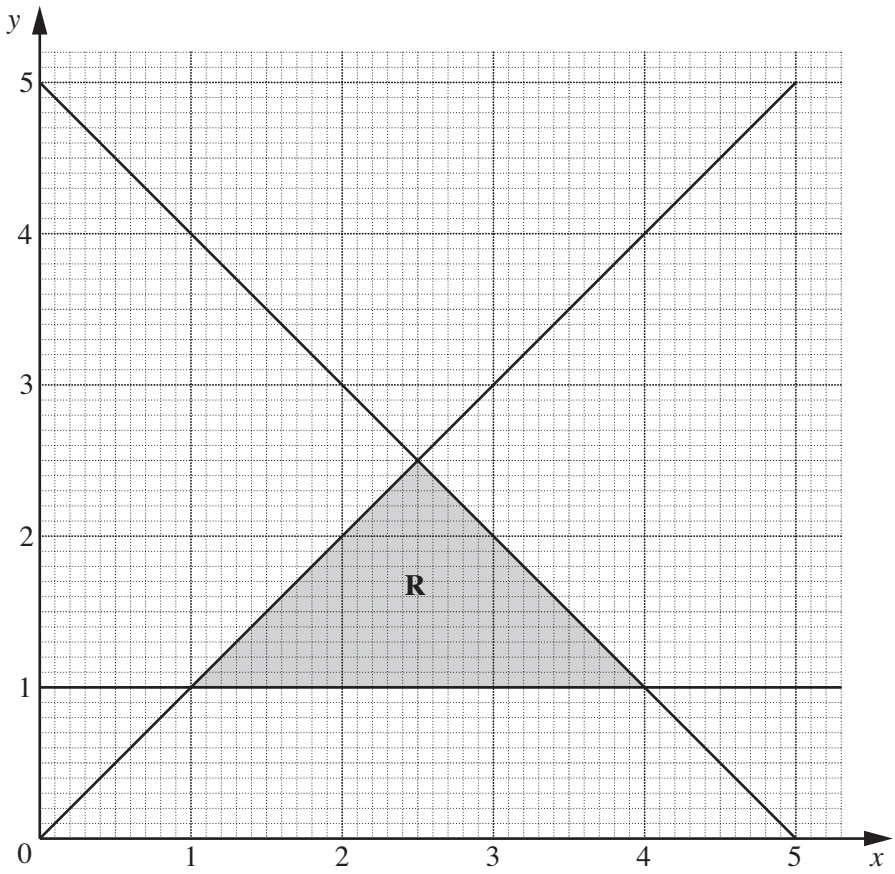
(b) Use your graph to describe the trend in sales over the period 2004 to 2006.

.....

..... [1]

4

12



The region, **R**, is defined by three inequalities.

One of these is $x + y \leqslant 5$.

Write down the other two inequalities.

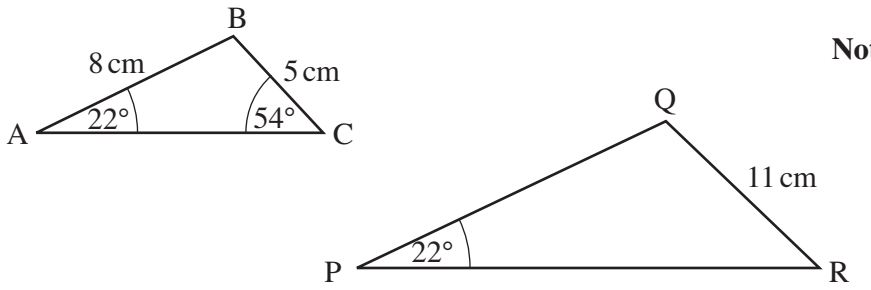
.....

..... [2]

2

TURN OVER FOR QUESTION 13

13 Triangles ABC and PQR are **similar**.



Not to scale

(a) Work out angle Q.

(a) .....° [2]

(b) Work out the length PQ.

(b) ..... cm [2]

4