OCR
RECOGNISING ACHIEVEMENT

B278B

GENERAL CERTIFICATE OF SECONDARY EDUCATION

MATHEMATICS C (GRADUATED ASSESSMENT)

MODULE M8 – SECTION B

M8

MONDAY 21 JANUARY 2008

Morning
Time: 30 minutes

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

Candidate Forename		Candidate Surname	

Centre Number		Candidate Number	

INSTRUCTIONS TO CANDIDATES

- Write your name in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use blue or 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.
- Do **not** write outside the box bordering each page.
- Write your answer to each question in the space provided.

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.
- Section B starts with question 8.
- 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.

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
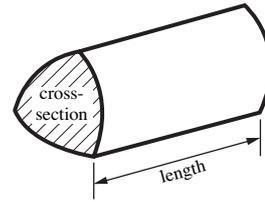
In any triangle ABC

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

Cosine rule $\quad a^2 = b^2 + c^2 - 2bc \cos A$
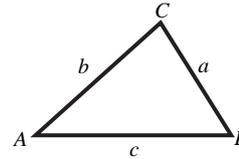
Area of triangle = $\frac{1}{2} ab \sin C$

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

Surface area of sphere = $4\pi r^2$
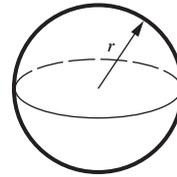
Volume of cone = $\frac{1}{3}\pi r^2 h$

Curved surface area of cone = $\pi r l$
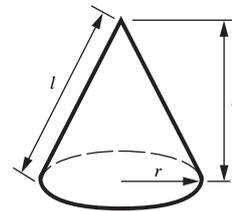
The Quadratic Equation

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)** The price of a TV set was £360.
It was reduced by 25% in a sale.
On the last day of the sale, the sale price was reduced by 20%.

Work out the overall percentage reduction.

(a)..................................% [4]

(b) A train fare was increased by 10%.
The **new fare** is £36·30.

Calculate the fare before the increase.

(b) £ .... [3]

7

[Turn over

9 The equation of a straight line is $y = 4x - 2$.

(a) Write down the coordinates of the point where this line crosses the *y*-axis.

(a) (............... , ...) [1]

(b) Write down the gradient of the line $y = 4x - 2$.

(b) .... [1]

(c) Write down the equation of a line parallel to $y = 4x - 2$.

(c) .... [1]

3	

10 This box plot summarises the distribution of marks scored in a mathematics examination by class 11A.

11A
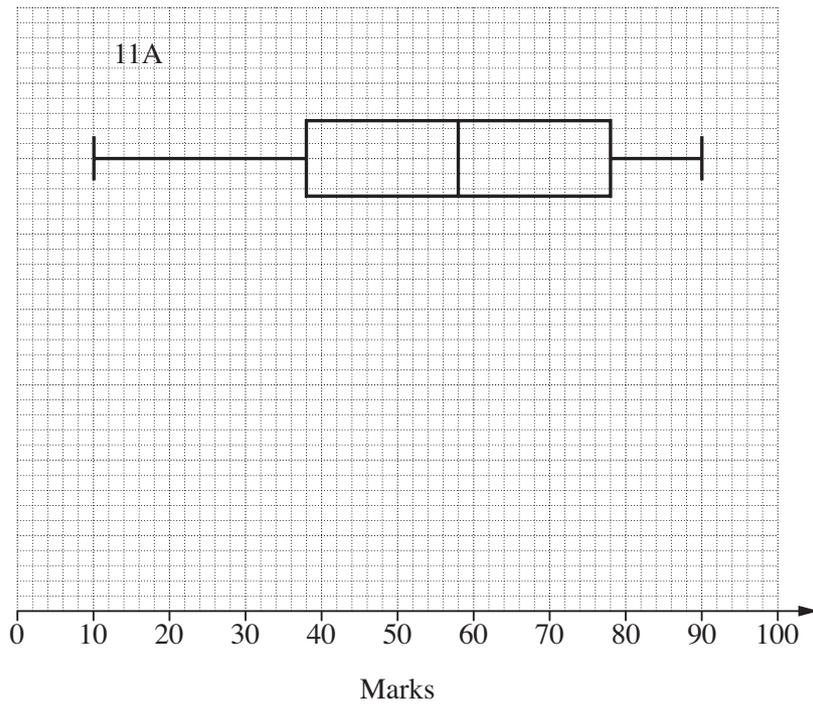
Marks

Class 11B took the same examination.

(a) Here is some information about the marks for class 11B.

Lowest score	12	Highest score	98
Median	52		
Lower quartile	34	Interquartile range	30

On the grid above draw the box plot for class 11B. [2]

(b) Make one comparison of the marks for class 11A and class 11B.

....

....

.... [1]

3

11 This table shows the number of visitors each quarter to a museum.

Year	2006				2007			
Quarter	1	2	3	4	1	2	3	4
Visitors (thousands)	8	15	17	14	12	17	21	15

(a) The first three 4-quarter moving averages are shown below.

Calculate the remaining two 4-quarter moving averages.

13 500   14 500   15 000   ....   [2]

(b) The museum director says:

The number of visitors is gradually increasing.

Explain how the data shows that this is true.

....

.... [1]

3

12
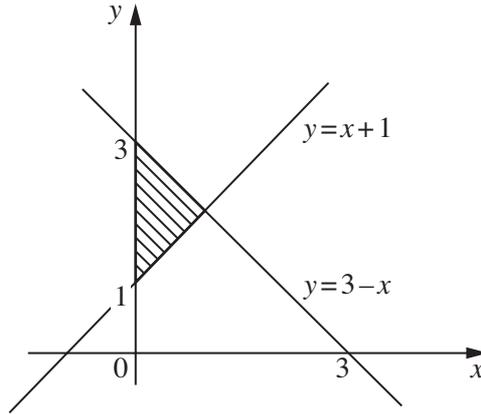
The shaded region can be identified by three inequalities.
One of the inequalities is $y \geqslant x + 1$.

Write down the other two inequalities.

....

.... [2]

2

13 Jason is 48 metres away from a tree.
The angle of elevation from the ground to the top of the tree is 25°.

Calculate h, the height of the tree.
Give your answer to an appropriate degree of accuracy.

Not to scale

.....................................m [4]
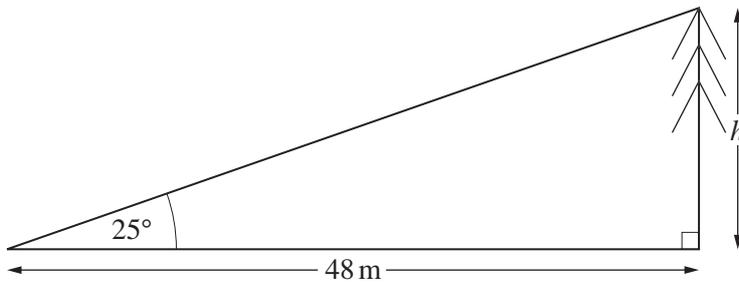
4

TURN OVER FOR QUESTION 14

14

Not to scale

B

A

14 cm

C

E

6 cm

D

8 cm

F
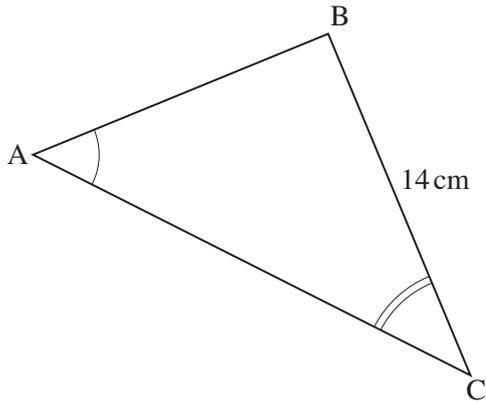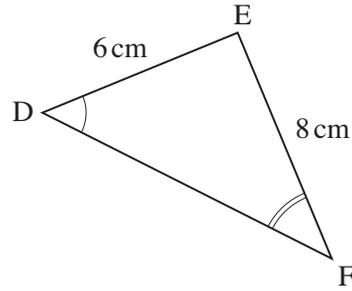
Triangles ABC and DEF are similar.

Calculate AB.

.... cm [3]