OCR
RECOGNISING ACHIEVEMENT

M7

GENERAL CERTIFICATE OF SECONDARY EDUCATION

MATHEMATICS C (GRADUATED ASSESSMENT) B277B

MODULE M7 – SECTION B

OCE/19555

Candidates answer on the Question Paper

OCR Supplied Materials:
None

Other Materials Required:
- Geometrical instruments
- Tracing paper (optional)
- Scientific or graphical calculator

Monday 8 March 2010
Morning

Duration: 30 minutes

B277B

Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

INSTRUCTIONS TO CANDIDATES

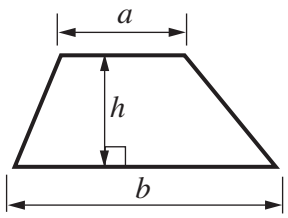
- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Show your working. 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

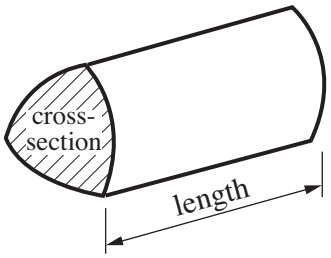
- The number of marks is given in brackets **[ ]** at the end of each question or part question.
- Section B starts with question 8.
- You are expected to use a calculator in Section B of this paper.
- Use the π button on your calculator or take π to be 3·142 unless the question says otherwise.
- The total number of marks for this Section is **25**.
- This document consists of **8** pages. Any blank pages are indicated.

Formulae Sheet

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



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



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8 Jenny's weekly earnings are increased from £235·50 by 3·7%.

Calculate her new earnings.

£ ..... **[3]**

9 A six-sided dice was thrown 200 times.
This table summarises the number of sixes thrown **altogether** at various stages, with some of the relative frequencies.

Total number of throws	20	50	100	150	200
Total number of sixes	2	7	12	18	26
Relative frequency of sixes	0·1	0·14	0·12		

(a) Complete the table. **[1]**

(b) Explain why the results show that the dice may be biased.

.....

..... **[2]**

10 **(a)** Aziz sees this sign on a busy motorway.

TO JUNCTION 11 DISTANCE 15 MILES TIME 25 MINUTES

At what average speed would Aziz travel to reach junction 11 in 25 minutes?
Give your answer in miles per hour.

(a) ..... mph **[3]**

(b) Mary often travels between junctions 6 and 10.
She kept a record of how long 30 of these journeys took.
This table summarises her results.

Time (t minutes)	Frequency
$10 < t \leqslant 20$	7
$20 < t \leqslant 30$	15
$30 < t \leqslant 40$	6
$40 < t \leqslant 50$	2

Calculate an estimate of Mary's mean time on these journeys.

(b) ..... minutes **[4]**

(c) The distance between junctions 5 and 6 is 9 miles, correct to the nearest mile.

Complete the following.

The distance between junctions 5 and 6 is

between …… miles and …… miles. **[2]**

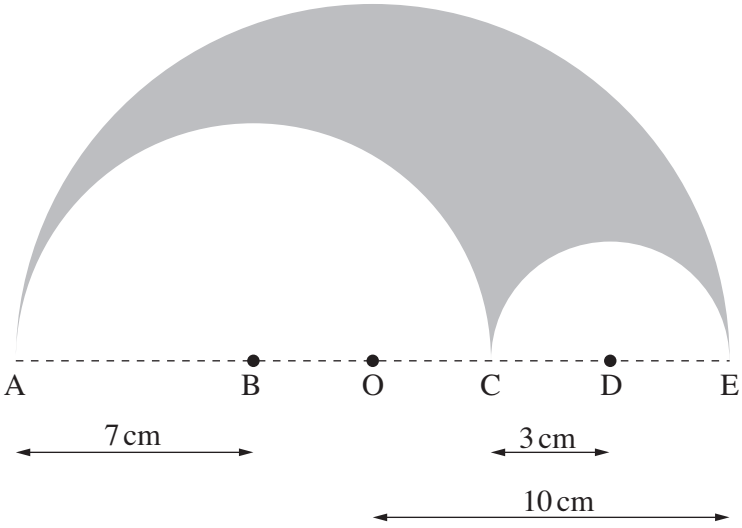
11 Rearrange this formula to make n the subject.

$W = 5n - 7$

..... **[2]**

12 The shape in this diagram is called an arbelos.
It is constructed from three semicircles with centres in a straight line.

For the arbelos below, the largest semicircle has radius OE = 10 cm.
The radii AB and CD of the smaller semicircles are 7 cm and 3 cm respectively.

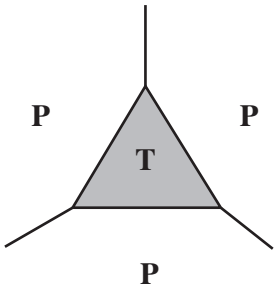


Not to scale

Calculate the shaded area of this arbelos.

..... cm^2 **[4]**

13 Here is part of a pattern of floor tiles.
It is made from regular polygons **P** and equilateral triangles **T**.
At each vertex, two polygons and one triangle meet, as shown.



Not to scale

Use facts about angles of polygons to show that **P** has 12 sides.
Show your reasoning clearly. **[4]**

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