M7

OCR RECOGNISING ACHIEVEMENT

Monday 16 January 2012 – Morning

GCSE MATHEMATICS C (GRADUATED ASSESSMENT)

B277A MODULE M7 – SECTION A

Candidates answer on the Question Paper.

OCR supplied materials:
None

Other materials required:
* Geometrical instruments
* Tracing paper (optional)

Duration: 30 minutes

Candidate forename		Candidate surname	

Centre number						Candidate number				

INSTRUCTIONS TO CANDIDATES

* Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
* Use black ink. HB pencil may be used for graphs and diagrams only.
* Answer **all** the questions.
* Read each question carefully. Make sure 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.
* Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
* Do **not** write in the bar codes.

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.
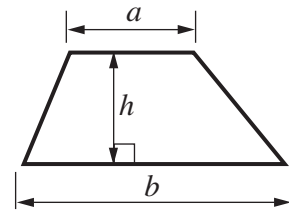
WARNING

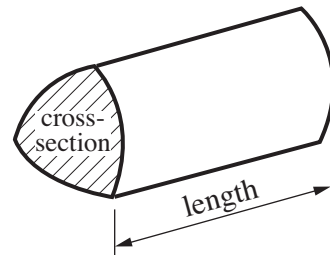No calculator can be used for Section A of this paper

This paper has been pre modified for carrier language

Turn over

Formulae Sheet

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

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

PLEASE DO NOT WRITE ON THIS PAGE

1 **(a)** Find the square root of 225.

(a)...................................... **[1]**

(b) Work out.

$$5^3 - 6^2$$

(b) .... **[2]**

(c) Calculate.

    (i) $6 \cdot 5 \times 0 \cdot 2$

(c)(i) .... **[1]**

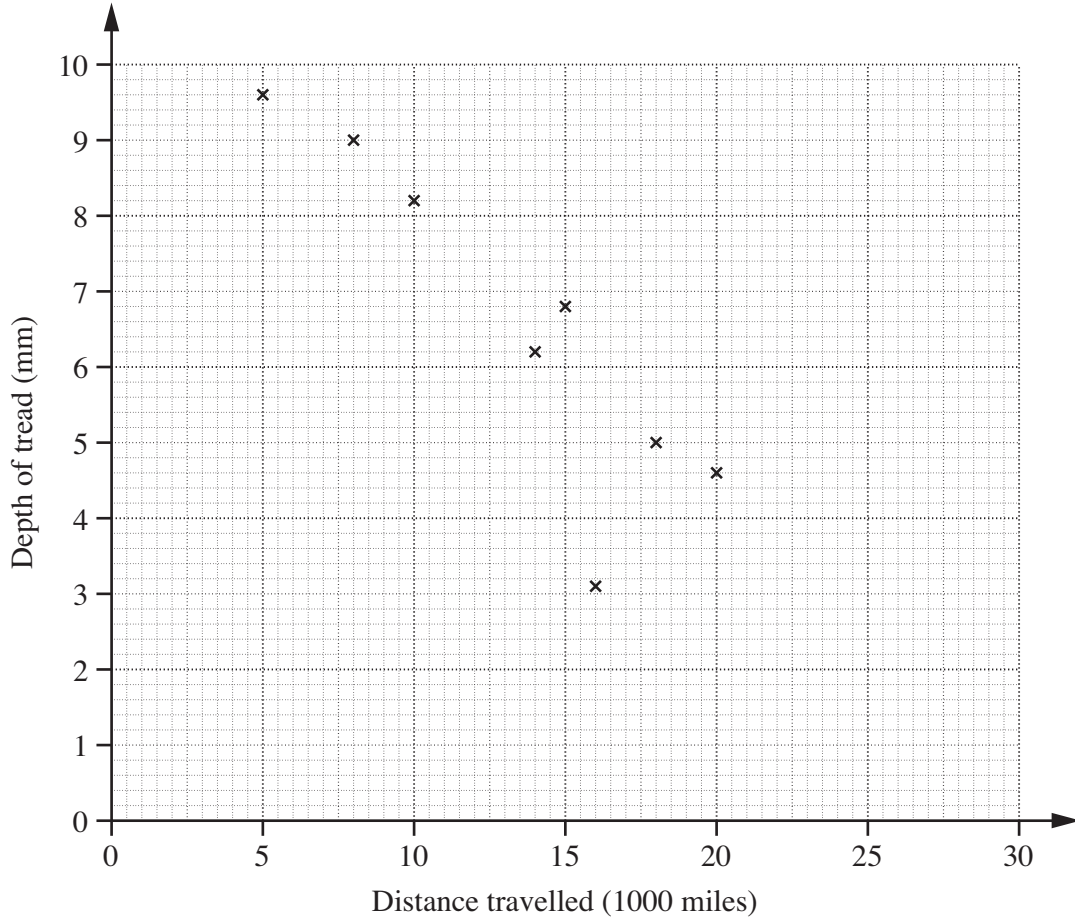   **(ii)** $12 \cdot 4 \div 0 \cdot 5$

(ii) .... **[2]**

2   A tyre manufacturer is investigating how its tyres wear out with use.
    This is done by recording the depth of tread on a tyre and the number of miles it has travelled.
    The table shows the results for ten tyres.

Distance travelled (1000 miles)	5	8	10	14	15	16	18	20	24	27
Depth of tread (mm)	9·6	9	8·2	6·2	6·8	3·1	5	4·6	3	2·1

The first eight points have been plotted on the scatter diagram.

(a) Complete the scatter diagram.   [1]

(b) Describe the correlation shown.

     .... [1]

(c) One of these tyres has worn differently from the others.

     On the graph, circle the point representing this tyre.   [1]

3 **(a)** The *n*th term of a sequence is $4 - 3n$.

Show that the first three terms of this sequence are $1, {}^-2$ and ${}^-5$.

....

....

....**[2]**

(b) Here are the first four numbers of a different sequence.

$$2 \qquad 7 \qquad 12 \qquad 17$$

Find the *n*th term of this sequence.

(b) .... **[2]**

Turn over

4 Sam is playing a fruit machine.

The table below shows how many wins she has for different numbers of plays.

Number of plays	10	20	50
Number of wins	3	4	7
Relative frequency of winning	0·3	0·2	....

(a) Complete the table for the relative frequency of wins after 50 plays.
Give your answer as a decimal. **[1]**

(b) Which of the relative frequencies is the best estimate of the probability that Sam wins on a play on the fruit machine?
Give a reason for your answer.

.... because .... **[1]**

(c) Use your answer from part **(b)** to estimate the number of wins that Sam would have in 1000 plays.

(c)...................................... **[1]**

5 **(a)** Simplify.

(i) $x^6 \times x^2$

(a)(i)................................. **[1]**

(ii) $x^6 \div x^2$

(ii) .... **[1]**

(b) **(i)** Solve.

$10x - 3 < 22$

(b)(i)................................ **[2]**

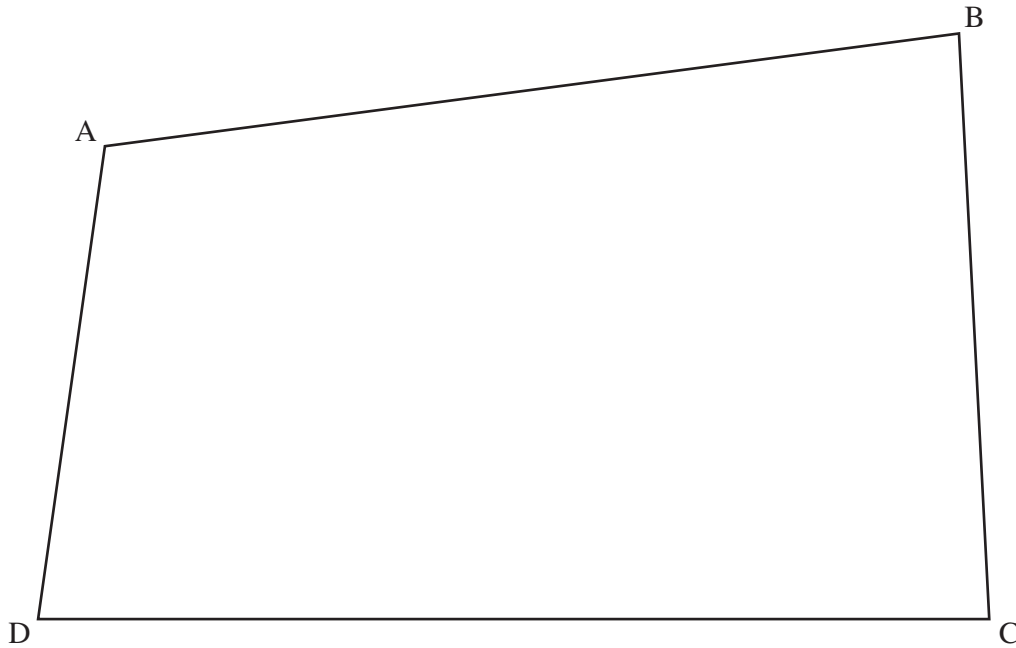**(ii)** Represent your solution to part **(b)(i)** on this number line.

[1]

TURN OVER FOR QUESTION 6

6   **In this question, leave in all your construction arcs.**

The diagram shows the scale drawing of a garden ABCD.

Scale : 1 cm to 1 m.

A bird table, T, is placed in the garden so that it is

- 10 m from D,

- equidistant from AB and BC.

Use ruler and compasses to construct both of these loci.
Find and mark the position of T.   **[4]**