UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

5557490338

MATHEMATICS **0580/32**

Paper 3 (Core) **October/November 2010**

2 hours

Candidates answer on the Question Paper.

Additional Materials: Electronic calculator
Mathematical tables (optional)
Geometrical instruments
Tracing paper (optional)

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use a pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
If working is needed for any question it must be shown below that question.
Electronic calculators should be used.
If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.
For π, use either your calculator value or 3.142.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.
The total of the marks for this paper is 104.

This document consists of **15** printed pages and **1** blank page.

For Examiner's Use

1 A drink consists of water and fruit juice.

(a) 24% of the drink is water.

Show that there is a total of 760 cm^3 of fruit juice in one litre of the drink.

Answer(a)

[2]

(b) What fraction of one litre of the drink is fruit juice?

Give your answer in its simplest form.

Answer(b) ..... [2]

(c) The 760 cm^3 of fruit juice in one litre of the drink is made from apple, mango and peach in the following ratio.

Apple : Mango : Peach = 6 : 15 : 17

Calculate the amount of apple juice.

Answer(c) ..... cm^3 [2]

(d) A shopkeeper buys bottles of the drink for 65 cents each.
He sells them for 80 cents each.

Calculate the percentage profit he makes on each bottle he sells.

Answer(d) ..... % [3]

For Examiner's Use

2 **(a)** **(i)** $f \times g = 90$

f and g are both integers **greater than 1**.

Write down one possible pair of values of f and g.

Answer(a)(i) $f =$ ..... and $g =$ ..... [1]

(ii) Find all the prime factors of 90.

Answer(a)(ii) ..... [3]

(b) Six number cards are shown below.

0	4	9	5	1	8

One or more of the cards are chosen to make different numbers.

For example | 5 | | 9 | makes the number 59.

Choosing a card or cards, write down

(i) a 2-digit odd number less than 40,

Answer(b)(i) ..... [1]

(ii) the largest 3-digit even number,

Answer(b)(ii) ..... [1]

(iii) a 2-digit square number greater than 50,

Answer(b)(iii) ..... [1]

(iv) a cube number,

Answer(b)(iv) ..... [1]

(v) a 2-digit multiple of 13,

Answer(b)(v) ..... [1]

(vi) the cube root of 64,

Answer(b)(vi) ..... [1]

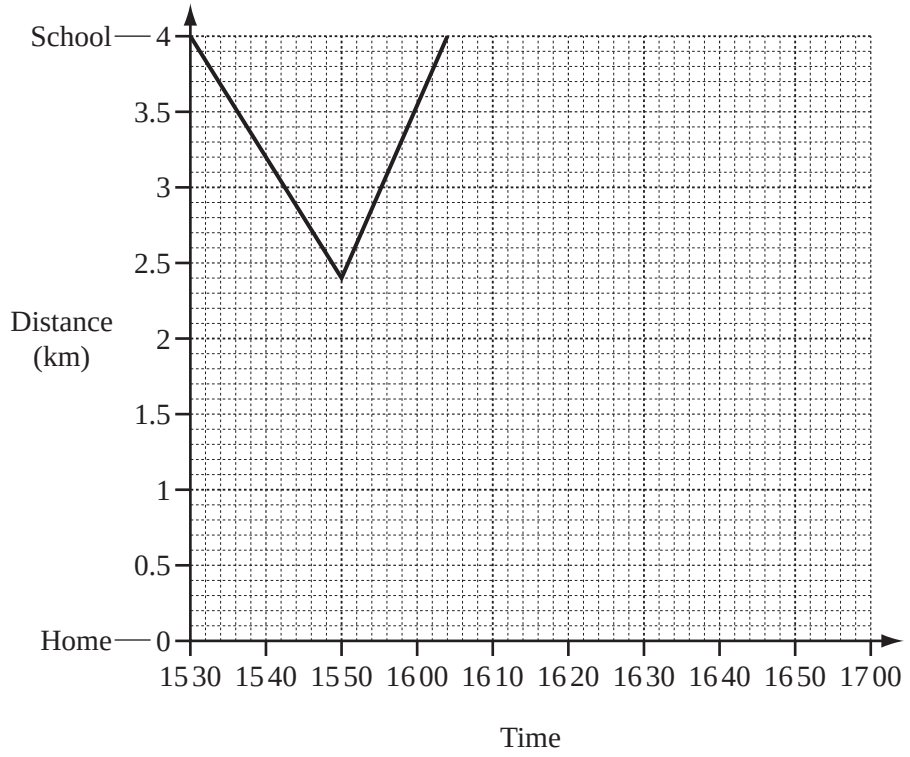
(vii) a prime number between 100 and 120.

Answer(b)(vii) ..... [1]

For Examiner's Use

3 Kim left school at 15 30 to walk home.
On the way home he remembered he had left a book at school.
He ran back to school and arrived at 16 04.

The travel graph shows his journey.



(a) Use the graph to answer the following questions.

(i) At what time did Kim start to run back to school?

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

(ii) How far was he from school at this time?

Answer(a)(ii) ..... km [1]

(iii) How many minutes did he take to run back to school?

Answer(a)(iii) ..... min [1]

(iv) What was his speed, in kilometres per hour, on his journey back to school?

Answer(a)(iv) ..... km/h [3]

For Examiner's Use

(b) Kim spent 6 minutes at school collecting his book.
He then walked home at a speed of 6 km/h.

(i) Complete the travel graph. [3]

(ii) At what time did Kim arrive home?

Answer(b)(ii) ..... [1]

(c) Kim's sister, Julie, left the school at 15 48.
She walked at a steady speed, without stopping, and arrived home 46 minutes later.

(i) On the grid, draw the travel graph of Julie's journey home from school. [2]

(ii) Complete the sentence.

..... arrived home first by ..... minutes. [1]

For Examiner's Use

4 An accurate scale drawing of three sides of a garden, AB, BC, and CD is shown on the opposite page. A is due north of B and C is due east of B.

(a) A vegetable area is to be constructed in the garden.

Parts (i) and (iii) must be completed using a straight edge and compasses only.

On the scale drawing

(i) construct the perpendicular bisector of BC, [2]

(ii) mark the point S at the midpoint of BC, [1]

(iii) construct the bisector of angle ABC, [2]

(iv) mark the point R where this line crosses the perpendicular bisector of BC, [1]

(v) mark the point Q on BA where $BQ = SR$, [1]

(vi) draw the vegetable area, quadrilateral $BQRS$. [1]

(b) On the scale drawing, 1 centimetre represents 6 metres.

Calculate the vegetable area in square metres.

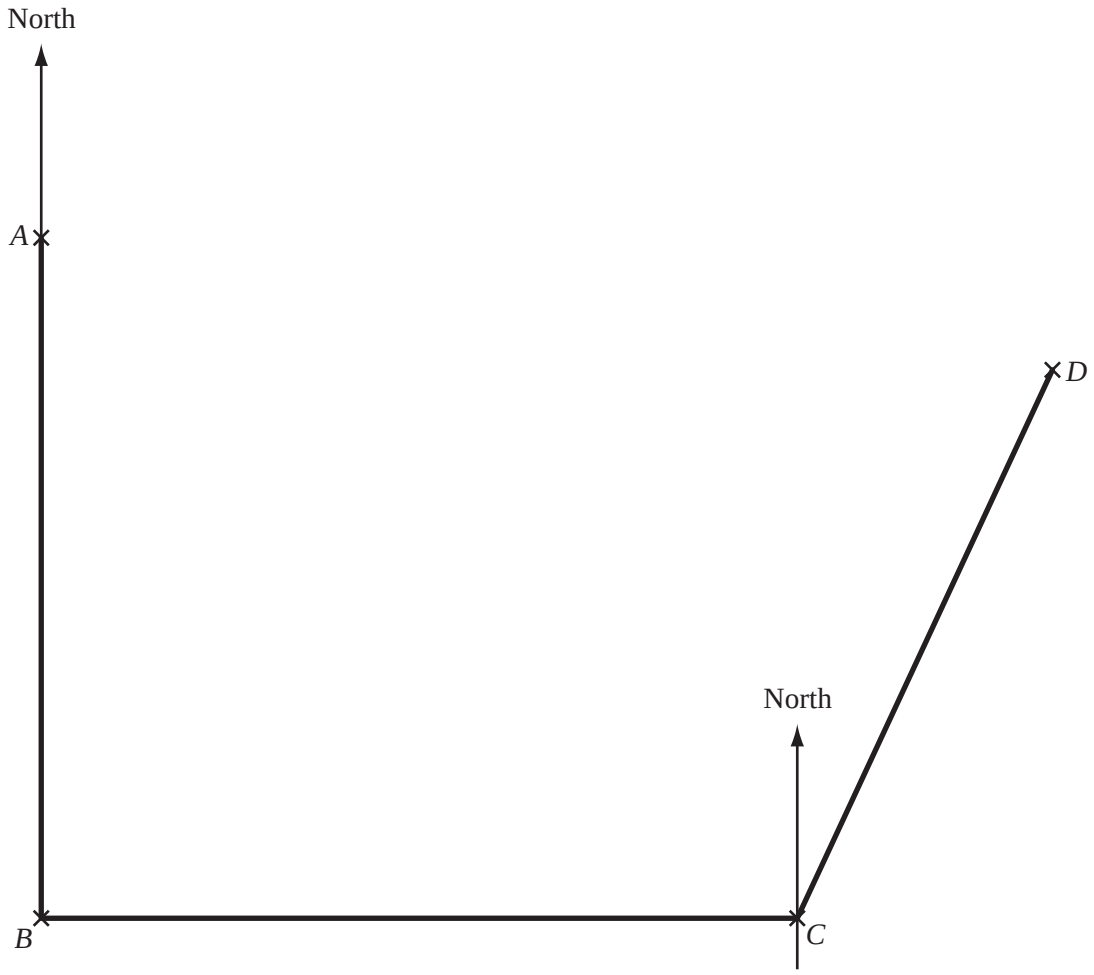
Answer(b) ..... m^2 [3]

(c) A tree, T, is on a bearing of 070° from A and 345° from C.

On the scale drawing, mark the position of T. [2]

(d) Draw accurately the locus of points which are 24 metres from the tree, T. [2]

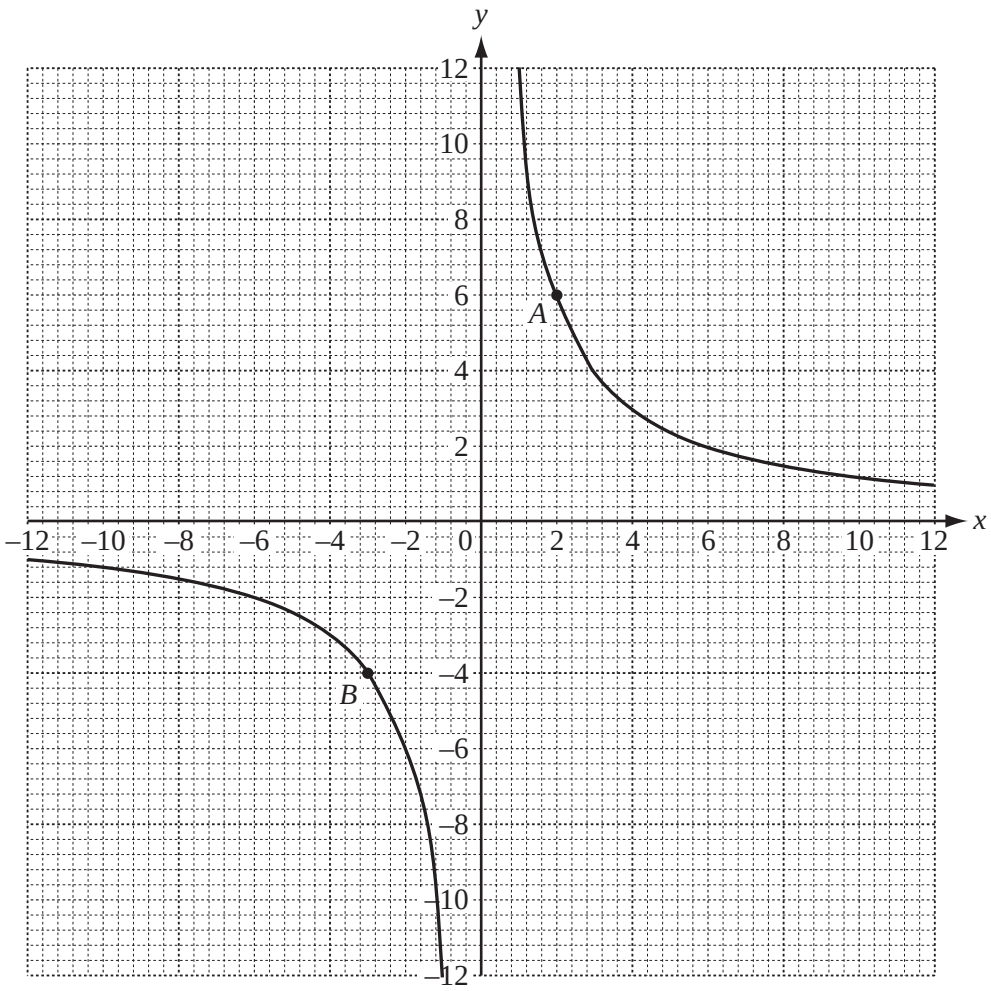
For Examiner's Use



Scale: 1 cm = 6 m

5

For Examiner's Use



A graph is drawn on the grid.
Points A and B are marked on the curves.

(a) (i) Write down the co-ordinates of the points A and B.

Answer(a)(i) A(..... , ...) and B(..... , ...) [2]

(ii) The equation of the graph is $xy = n$.

Write down the value of n.

Answer(a)(ii) n = ... [1]

For Examiner's Use

(b) (i) Write down the order of rotational symmetry of the graph.

Answer(b)(i) ..... [1]

(ii) On the grid, draw the lines of symmetry of the graph. [2]

(iii) Write down the equation of each line of symmetry.

Answer(b)(iii) ..... and ..... [2]

(c) (i) One line of symmetry crosses both curves.

Write down the x co-ordinates of the points where this line meets each curve.
Give your answers to 1 decimal place.

Answer(c)(i) $x =$ ..... and $x =$ ..... [2]

(ii) On the grid, draw the line which passes through the point (0, 4) and is parallel to the line of symmetry in **part (c)(i)**. [1]

(iii) Write down the equation of this line in the form $y = mx + c$.

Answer(c)(iii) $y =$ ..... [2]

For Examiner's Use

6 **(a)** The formula for finding the interior angle of a regular polygon with n sides is given below.

$$\text{Interior angle} = \frac{180(n-2)}{n}$$

(i) Find the size of the interior angle of a regular polygon with 9 sides.

Answer(a)(i) ..... [2]

(ii) Multiply out the brackets.

$180(n-2)$

Answer(a)(ii) ..... [1]

(iii) A regular polygon has an interior angle of 156°.

How many sides does this polygon have?

Answer(a)(iii) ..... [3]

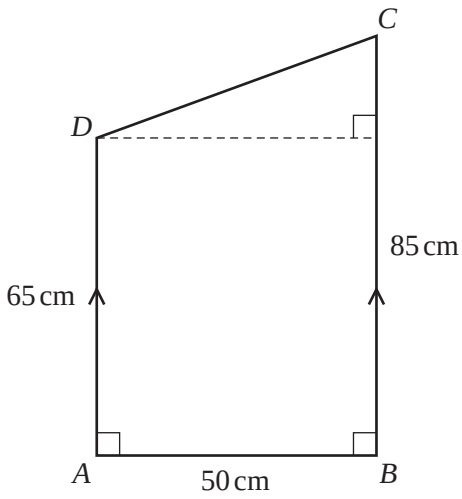
(b) Solve the simultaneous equations.

$$3x + 5y = 9$$
$$x + 2y = 4$$

Answer(b) x = ...

y = ... [3]

7



NOT TO SCALE

The diagram represents the cross-section of a storage box.
AB = 50 cm, AD = 65 cm and BC = 85 cm.
AD is parallel to BC.

(a) Write down the geometrical name of the quadrilateral $ABCD$.

Answer(a) ..... [1]

(b) Calculate angle DCB.

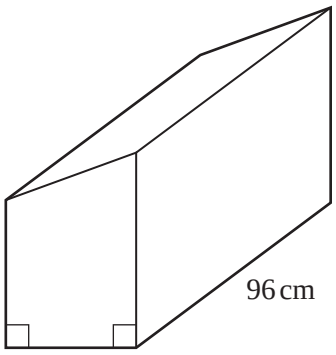
Answer(b) Angle DCB = ... [3]

(c) Calculate the area of the cross-section $ABCD$.

Answer(c) ..... cm^2 [2]

(d) The storage box is 96 cm long.

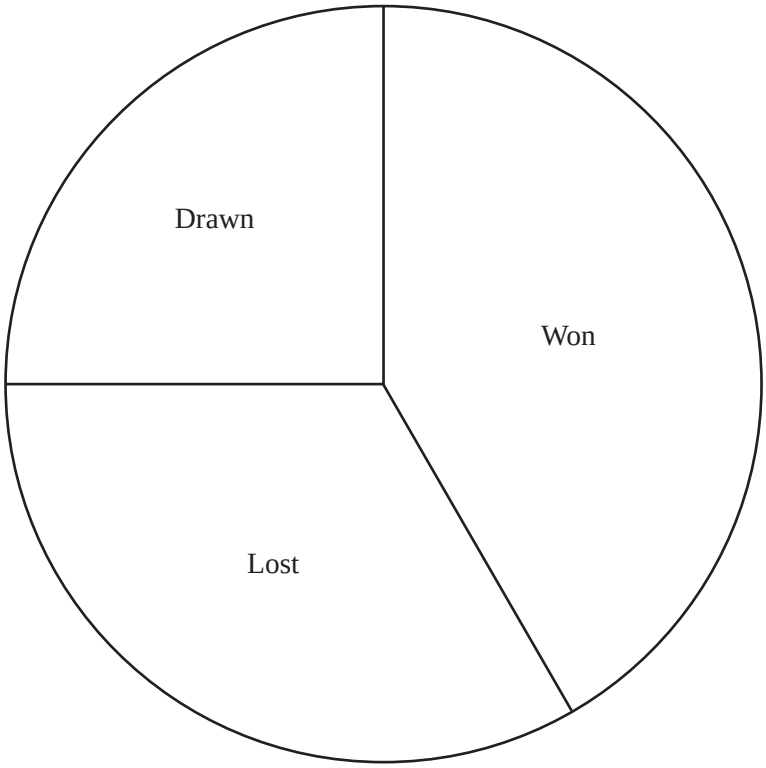
Calculate the volume of the box.
Write down the units of your answer.



Answer(d) ..... [2]

For Examiner's Use

8 **(a)** The results of 24 games of hockey played by a school team in one year are shown in the pie chart below.



(i) Show that the school team won 10 games during the year.

Answer(a)(i)

[2]

(ii) Find how many games were lost and how many games were drawn.

Answer(a)(ii) Lost .....

Drawn ..... [3]

For Examiner's Use

(b) The number of goals scored by the hockey team in each of the 24 games are shown below.

0	2	1	1	0	3	2	5
3	0	2	3	2	1	4	0
2	1	2	1	0	1	4	1

(i) Complete the frequency table below. You may use the tally column to help you.

Number of goals per game	Tally	Number of games
0		
1		
2		
3		
4		
5		

[2]

(ii) Write down the mode.

Answer(b)(ii) ..... [1]

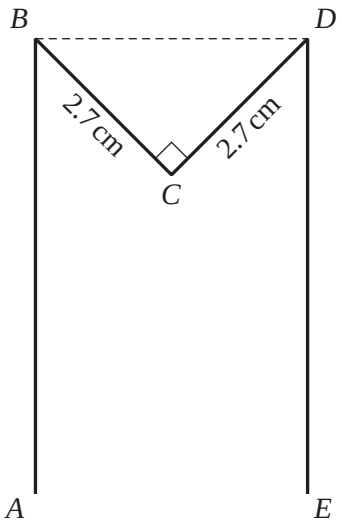
(iii) Find the median.

Answer(b)(iii) ..... [2]

(iv) Calculate the mean number of goals per game.

Answer(b)(iv) ..... [3]

9



NOT TO SCALE

(a) In the diagram above, *AB* and *ED* are vertical.
The diagram is symmetrical about a line through *C* parallel to *AB*.
Angle *BCD* = 90° and *BC* = *CD* = 2.7 cm.

(i) Calculate *BD*.

Answer(a)(i) *BD* = ... cm [2]

(ii) Complete the statement.

Triangle *BCD* is right-angled and ..... [1]

(iii) Find the size of angle *ABC*.

Answer(a)(iii) Angle *ABC* = ... [1]

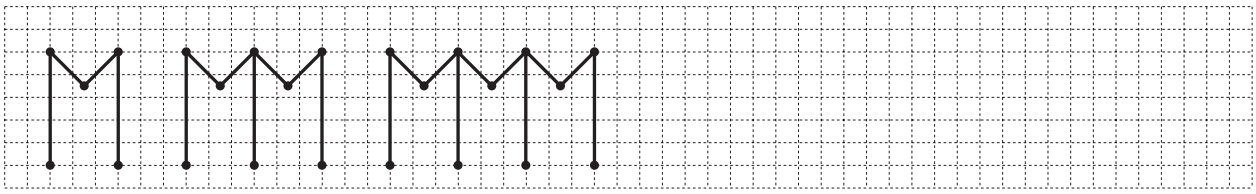


Diagram 1 Diagram 2 Diagram 3 Diagram 4

(b) The pattern of diagrams above is continued by adding more lines and dots.

(i) On the grid, draw diagram 4. [1]

(ii) Complete the table below.

Diagram	1	2	3	4	5
Number of lines	4	7			

[2]

(c) How many lines will there be in

(i) Diagram 9,

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

(ii) Diagram n?

Answer(c)(ii) ..... [2]

(d) The number of lines in Diagram r is 76.

Find the value of r.

Answer(d) $r =$ ..... [2]

(e) Write down an expression, in terms of n, for the number of **dots** in Diagram n.

Answer(e) ..... [1]

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