UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

6997528550

MATHEMATICS **0580/33**

Paper 3 (Core) **October/November 2012**

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 **16** printed pages.

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1 **(a)** Angelica goes to watch a football match.
She entered the stadium at 19 20 and left at 22 05.

Work out the number of hours and minutes she was in the stadium.

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

(b) The number of people watching the football match was 25 926.

Write 25 926 correct to the nearest thousand.

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

(c) The football club buys lemonade in 5 litre bottles.

Work out the number of 250 millilitre drinks that can be poured from one bottle.



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

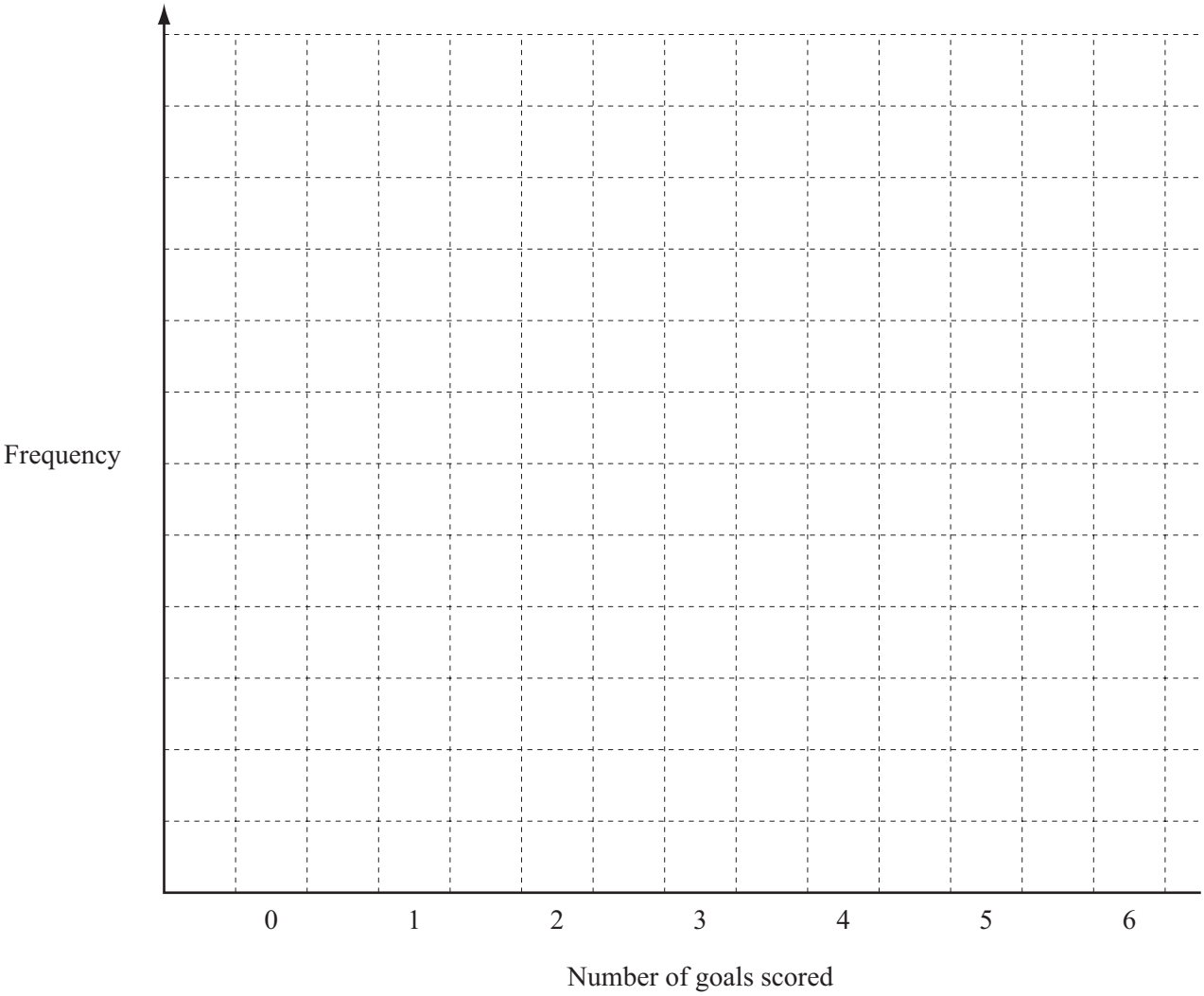
(d) The table shows the number of goals scored in each match by Mathsletico Rangers.

Number of goals scored	Number of matches
0	4
1	11
2	6
3	3
4	2
5	1
6	2

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(i) Draw a bar chart to show this information.
Complete the scale on the frequency axis.



[3]

(ii) Write down the mode.

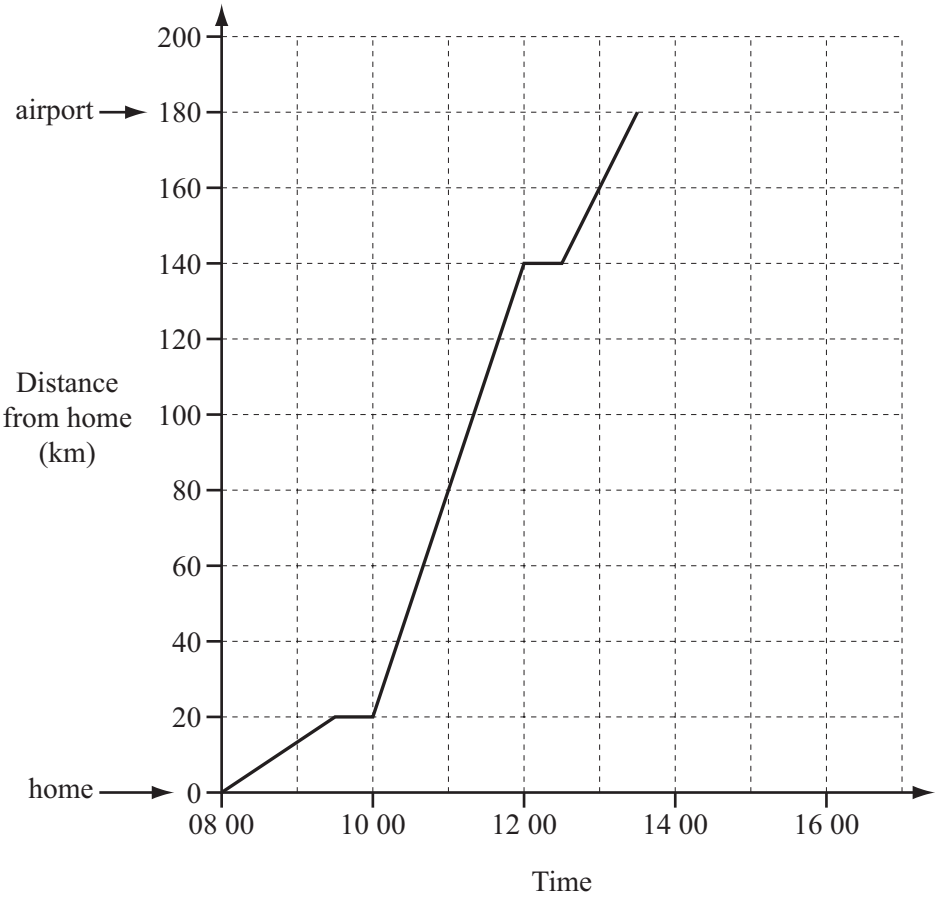
Answer(d)(ii) ..... [1]

(iii) Calculate the mean.

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

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2 **(a)** The travel graph shows Helva's journey from her home to the airport.



(i) What happened at 09 30?

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

(ii) Work out the time taken to travel from home to the airport.
Give your answer in hours and minutes

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

(iii) Calculate Helva's average speed for the whole journey from home to the airport.

Answer(a)(iii) ..... km/h [2]

(iv) Between which two times was Helva travelling fastest?

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

(v) Helva's husband left their home at 11 00 and travelled directly to the airport.
He arrived at 15 30.

Complete the travel graph for his journey. [1]

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(b) (i) Helva and her husband are flying from Finland to India.
Their plane takes off at 17 00 and arrives in India 7 hours 25 minutes later.

The time in India is $3\frac{1}{2}$ hours ahead of the time in Finland.

What is the local time in India when the plane arrives?

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

(ii) The temperature is −3°C in Finland and 23°C in India.

Write down the difference between these two temperatures.

Answer(b)(ii) ..... °C [1]

(c) Helva exchanged 7584 rupees for euros (€).
The exchange rate was 1€ = 56 rupees.

How many euros did Helva receive?
Give your answer correct to 2 decimal places.

Answer(c) € ..... [2]

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3 Mrs Ali sold her house for \$600 000.

(a) She gives $\frac{2}{5}$ of the money to her son.

Work out how much her son receives.

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

(b) Mrs Ali gives \$2400 to her grandchildren Elize, Sam and Juan in the ratio

Elize : Sam : Juan = 8 : 3 : 5 .

Calculate how much they each receive.

Answer(b) Elize \$ .....

Sam \$ .....

Juan \$ ..... [3]

(c) Mrs Ali invests \$200 000 for 3 years at a rate of 4% per year compound interest.

Calculate the total amount of money she will have at the end of the 3 years.
Give your answer correct to the nearest dollar.

Answer(c) \$ ..... [3]

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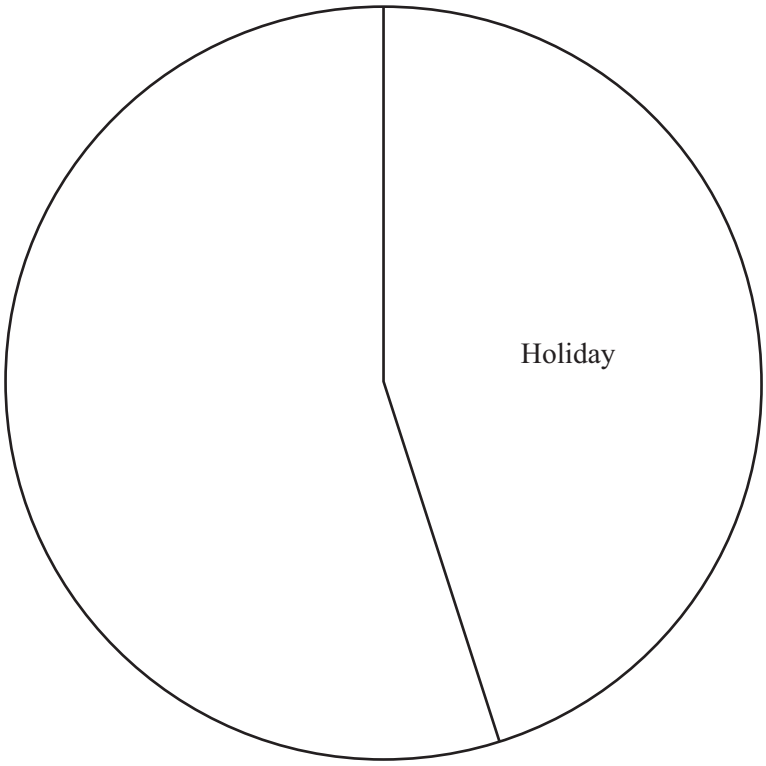
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(d) Mrs Ali spends a total of $9000 on the following items.

	Amount spent ($)	Angle in pie chart
Holiday	4050	162°
Television		90°
Clothes	1800	72°
Computer		

(i) Complete the table. [3]

(ii) Complete the pie chart.
Label each of your sectors.



[2]

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4 **(a)** Solve the following equations.

(i) $6x - 2 = 2x + 8$

Answer(a)(i) $x =$ ..... [2]

(ii) $4(2y - 3) = 24$

Answer(a)(ii) $y =$ ..... [3]

(b) Solve the simultaneous equations.

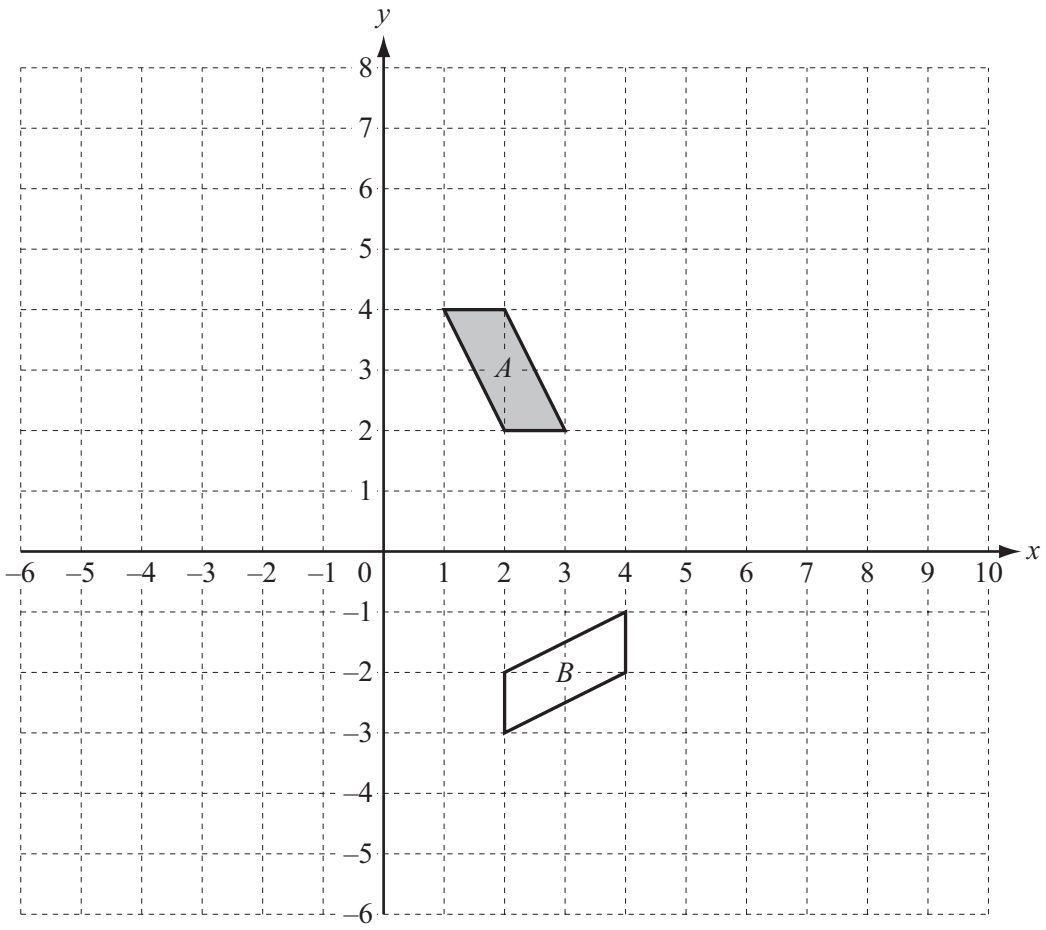
$$5x + 9y = -21$$
$$12x - 2y = 44$$

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

$y =$ ..... [4]

5

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(a) What special type of quadrilateral is shape *A*?

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

(b) Describe fully the **single** transformation which maps shape *A* onto shape *B*.

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

(c) On the grid

(i) reflect shape *A* in the *y*-axis and label the image *C*, [2]

(ii) translate shape *A* by $\begin{pmatrix} -6 \\ -4 \end{pmatrix}$ and label the image *D*, [2]

(iii) enlarge shape *A* by scale factor 2, with centre (0, 0) and label the image *E*. [2]

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6 **(a)** These are the first four terms of a sequence.

19 15 11 7

(i) Write down the next two terms of this sequence.

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

(ii) Write down the rule for finding the next term of this sequence.

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

(iii) Find an expression for the nth term of this sequence.

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

(b) The nth term of another sequence is $2n + 6$.

Write down the first three terms of this sequence.

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

(c) The first three diagrams of a different sequence are shown below.

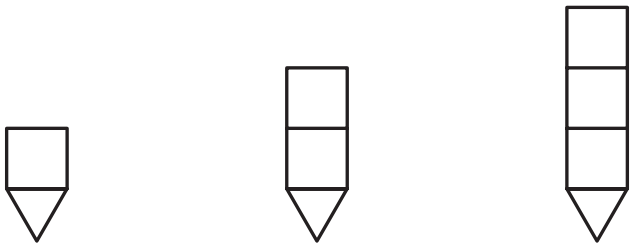


Diagram 1 Diagram 2 Diagram 3

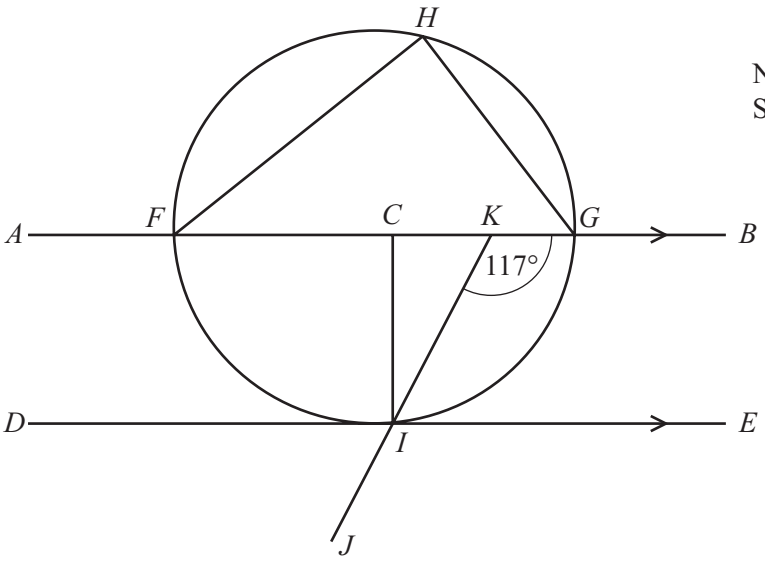
Complete the table.

Diagram	1	2	3		8		n
Number of lines	6	9	12				

[3]

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7



The points F, G, H and I lie on a circle, centre C.
FG is a diameter and DE is a tangent to the circle at I.
DE is parallel to AB and angle $GKI = 117°$.

Complete the following statements.

(a) Angle $FKI =$ ..... because .....

..... [2]

(b) Angle $FHG =$ ..... because .....

..... [2]

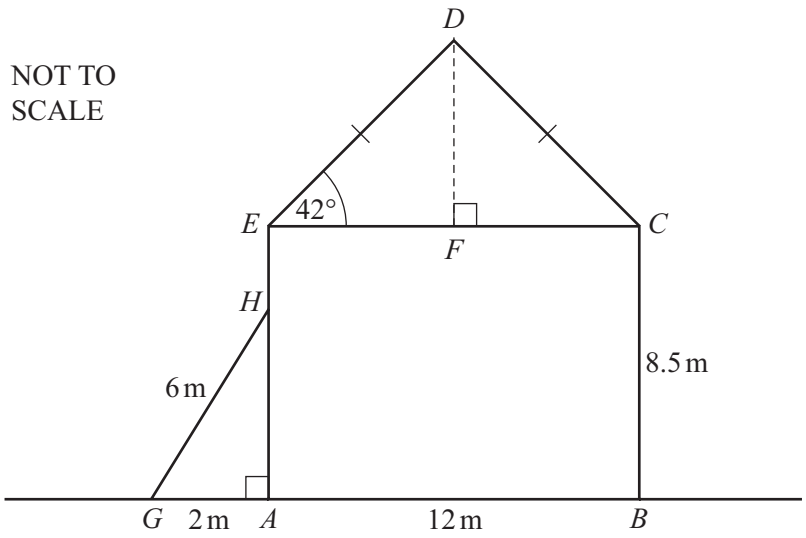
(c) Angle $EIJ =$ ..... because .....

..... [2]

(d) Angle $CIE =$ ..... because .....

..... [2]

8



The diagram shows a house, built on level ground.
ABCE is a rectangle with *AB* = 12 m and *BC* = 8.5 m.
CDE is an isosceles triangle.

(a) Use trigonometry to calculate *DF*.

Answer(a) DF = ... m [2]

(b) Calculate the area of triangle *CDE*.

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

(c) A ladder, *GH*, of length 6 m, leans against the house wall.
The foot of the ladder is 2 m from this wall.

Calculate *AH*.

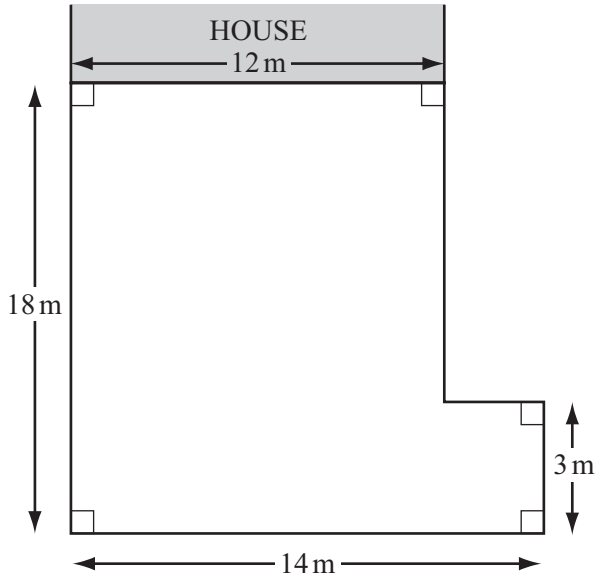
Answer(c) AH = ... m [3]

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(d) This diagram shows the plan of the driveway to the house.



NOT TO SCALE

Work out the perimeter of the driveway.

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

(e) The driveway is made from concrete.
The concrete is 15 cm thick.

Calculate the volume of concrete used for the driveway.
Give your answer in cubic metres.

Answer(e) ..... m^3 [4]

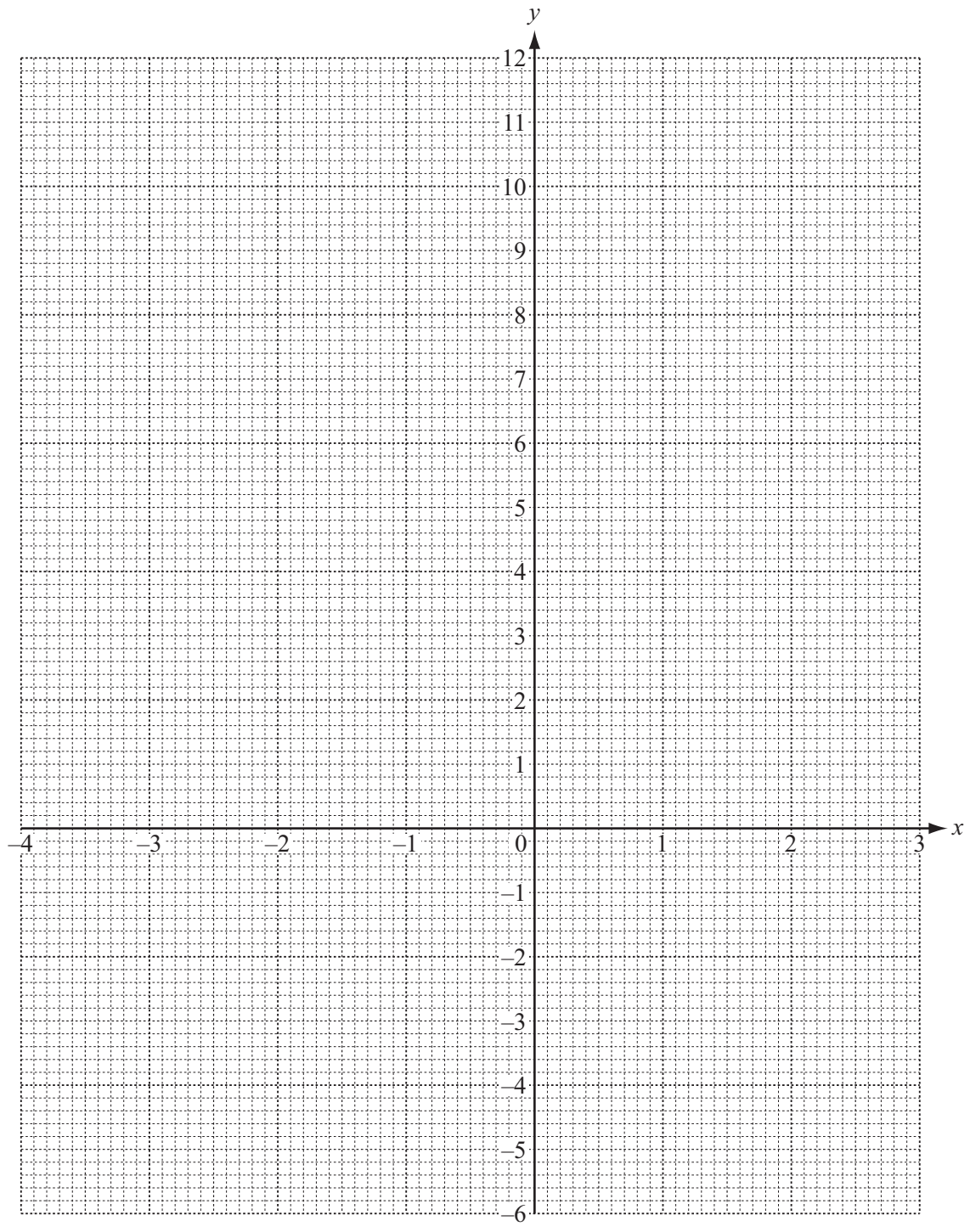
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9 **(a)** Complete the table of values for $y = x^2 + 2x - 4$.

x	-4	-3	-2	-1	0	1	2	3
y	4		-4		-4			11

[3]

(b) On the grid, draw the graph of $y = x^2 + 2x - 4$ for $-4 \leqslant x \leqslant 3$.



[4]

(c) **(i)** Draw the line of symmetry on the graph. [1]

(ii) Write down the equation of this line of symmetry.

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

(d) Use your graph to solve the equation $x^2 + 2x - 4 = 3$

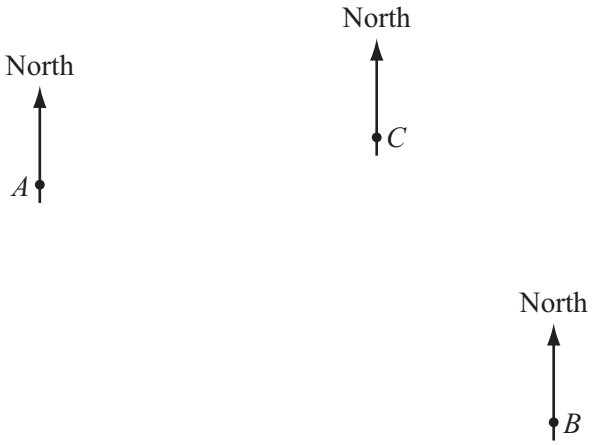
Answer(d) $x =$ ..... or $x =$ ..... [2]

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Question 10 is printed on the next page.

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10 **(a)** The diagram shows the positions of three towns A, B and C.
The scale is 1 cm represents 2 km.



Scale: 1 cm = 2 km

(i) Find the distance in kilometres from A to B.

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

(ii) Town D is 9 km from A on a bearing of 135°.
Mark the position of town D on the diagram. [2]

(iii) Measure the bearing of A from C.

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

(b) The population of town C is 324 100.

(i) Write this number in standard form.

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

(ii) The population of town D is 7.64×10^4.

Which town, C or D, has the larger population and by how much?
Give your answer in standard form.

Answer(b)(ii) Town ..... by ..... [3]

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