Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME	
CENTRE NUMBER	
CANDIDATE NUMBER	

6148841135

MATHEMATICS **0580/32**

Paper 3 (Core) **May/June 2016**

2 hours

Candidates answer on the Question Paper.

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

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 an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, 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.

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **18** printed pages and **2** blank pages.

© UCLES 2016

1 **(a)** A group of 20 children were asked to choose their favourite type of fruit juice.
The results are listed below.

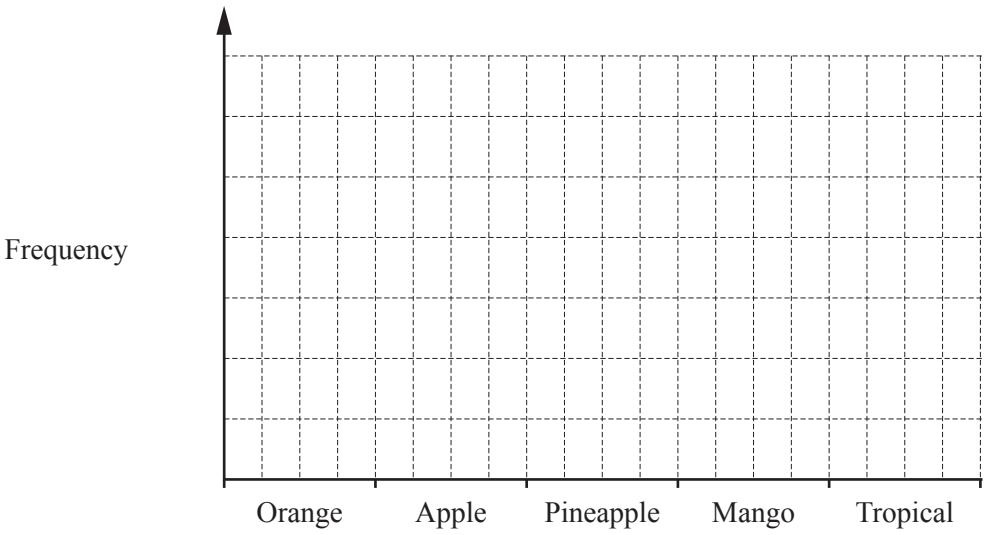
Orange	Apple	Apple	Pineapple	Mango
Tropical	Orange	Mango	Apple	Mango
Pineapple	Apple	Apple	Mango	Orange
Apple	Mango	Pineapple	Orange	Apple

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

Type of juice	Tally	Frequency
Orange		
Apple		
Pineapple		
Mango		
Tropical		

[2]

(ii) Draw a bar chart to show these results.
Remember to mark the scale on the frequency axis.



[3]

(iii) Sarah has a pack of 20 cartons of juice.
5 are orange, 5 are apple, 5 are pineapple and 5 are mango.
She would like to give each child their favourite type of juice.

How many children will **not** get their favourite type of juice?

..... [1]

© UCLES 2016

(b) One litre of a mixed fruit drink contains 550 millilitres of apple juice.

Write down the fraction of the drink that is apple juice.
Give your answer in its simplest form.

..... [2]

(c) Amir wants to buy a bottle of fruit juice.
There are three sizes of bottle.

0.9 litres $2.40	1.25 litres $3.15	1.35 litres $3.50

Work out which size of bottle gives the best value.
Show how you decide.

..... [3]

(d) The amount of juice in a glass, j millilitres, is 150 millilitres correct to the nearest 10 millilitres.

Complete this statement about the value of j.

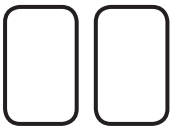
..... $\leqslant j <$ ..... [2]

2 **(a)** Here are five number cards.

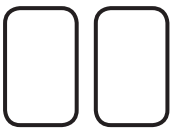


Place two cards side-by-side to show

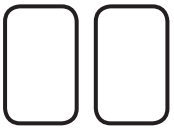
(i) a two-digit multiple of 7,

 [1]

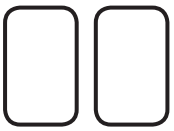
(ii) a two-digit square number,

 [1]

(iii) a two-digit cube number,

 [1]

(iv) a two-digit prime number.

 [1]

(b) $\sqrt{2}$ 5.85 4.1^2 π

Write down all the numbers in this list that are irrational.

..... [1]

(c) Put one pair of brackets into this calculation to make it correct.

$7 \times 5 - 2 + 3 = 42$ [1]

© UCLES 2016

(d) Work out.

(i) $\sqrt[3]{0.729}$

..... [1]

(ii) 5^4

..... [1]

(iii) 4^{-2}

..... [1]

(e) **(i)** Write 60 as a product of its prime factors.

..... [2]

(ii) Find the lowest common multiple (LCM) of 36 and 60.

..... [2]

3 **(a)** Here is part of a bus timetable.

Town Hall	10 15	10 35	10 55	11 15
City Gate	10 32	10 52	11 12	11 32
Beacon Hill	10 58	11 18	11 38	11 58
Kingswood Park	11 10	11 30	11 50	12 10

(i) Yana leaves home at 10 50.
She takes 14 minutes to walk to the bus stop at City Gate.

At what time does she reach the bus stop?

..... [1]

(ii) She gets on the next bus to Kingswood Park.

At what time does this bus arrive at Kingswood Park?

..... [1]

(iii) Work out how many minutes the bus takes to get from City Gate to Kingswood Park.

.....min [1]

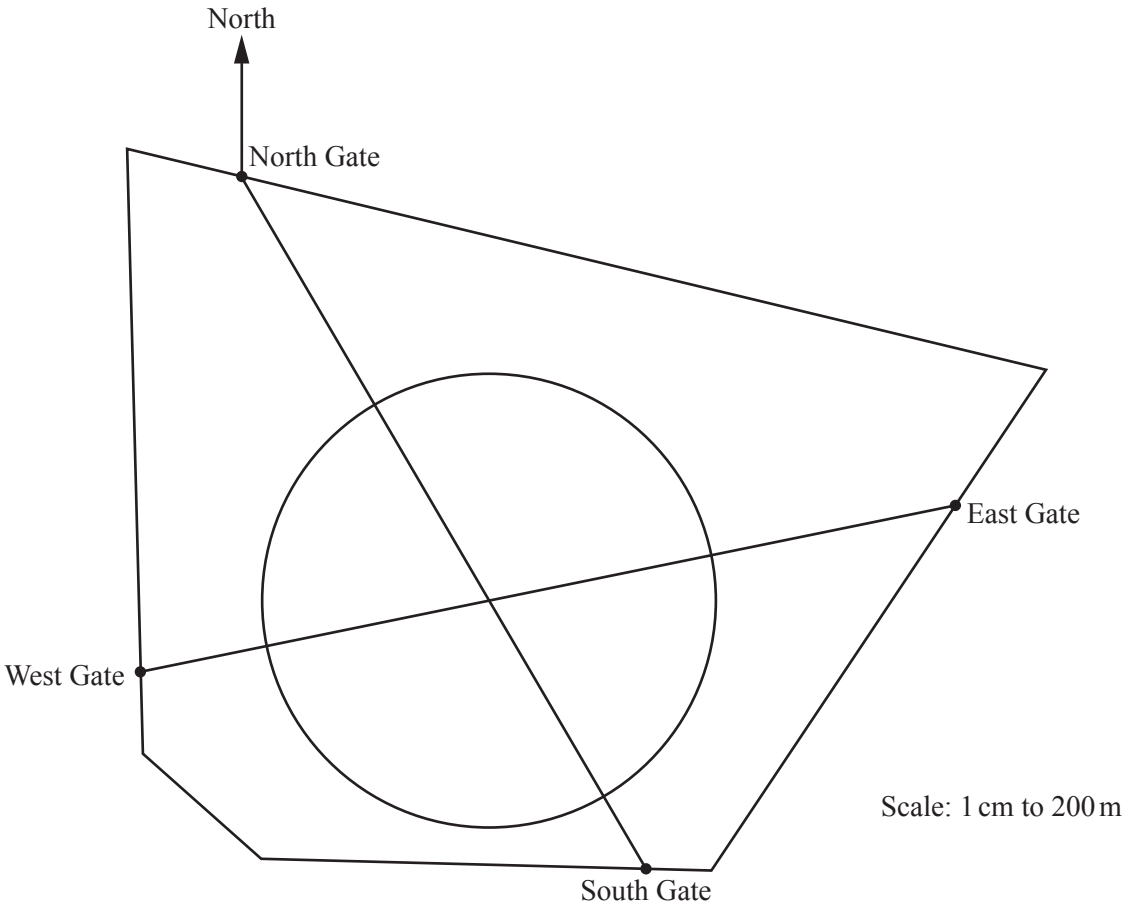
(b) Ivan walks 1.5 km from his home to Kingswood Park.
He takes 20 minutes.

Work out Ivan's average speed in kilometres per hour.

.....km/h [1]

© UCLES 2016

(c) The scale drawing shows a map of Kingswood Park.
There are two straight paths and one circular path.
The scale is 1 centimetre represents 200 metres.



(i) Yana walks along the straight path from East Gate to West Gate.

Work out the distance she walks.
Give your answer in kilometres.

..... km [2]

(ii) Measure the bearing of South Gate from North Gate.

..... [1]

(iii) The entrance to a children's play area, P, is 500 metres from North Gate on a bearing of 195°.
Mark the position of P on the map. [2]

(iv) Ivan runs around the circular path once.

Calculate the distance Ivan runs.

..... m [4]

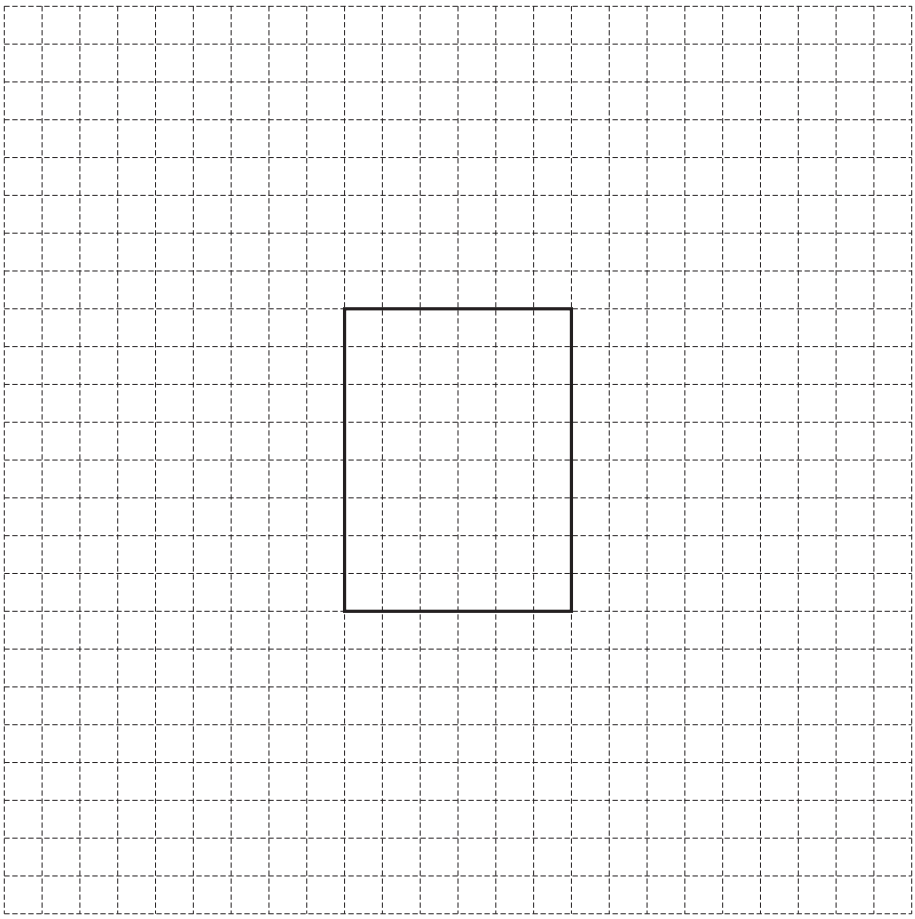
© UCLES 2016

4 **(a)** A cuboid has length 4 cm, width 3 cm and height 1.5 cm.

(i) Calculate the volume of the cuboid.

..... cm^3 [2]

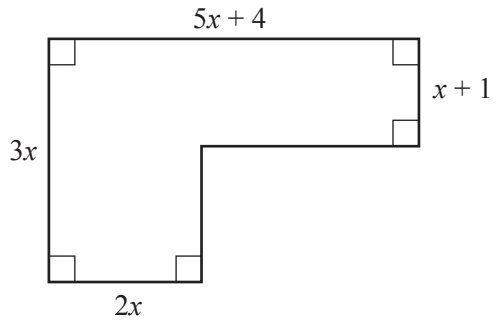
(ii) On the grid, draw an accurate net of the cuboid.
One face has been drawn for you.



[3]

© UCLES 2016

(b)



NOT TO SCALE

In the diagram, all lengths are in centimetres.

(i) Find an expression, in terms of x, for the perimeter of the shape.
Give your answer in its simplest form.

..... [2]

(ii) The perimeter of the shape is 72 cm.

Work out the value of x.

$x =$ ..... [2]

(iii) Calculate the total area of the shape.

..... cm^2 [3]

© UCLES 2016

[Turn over

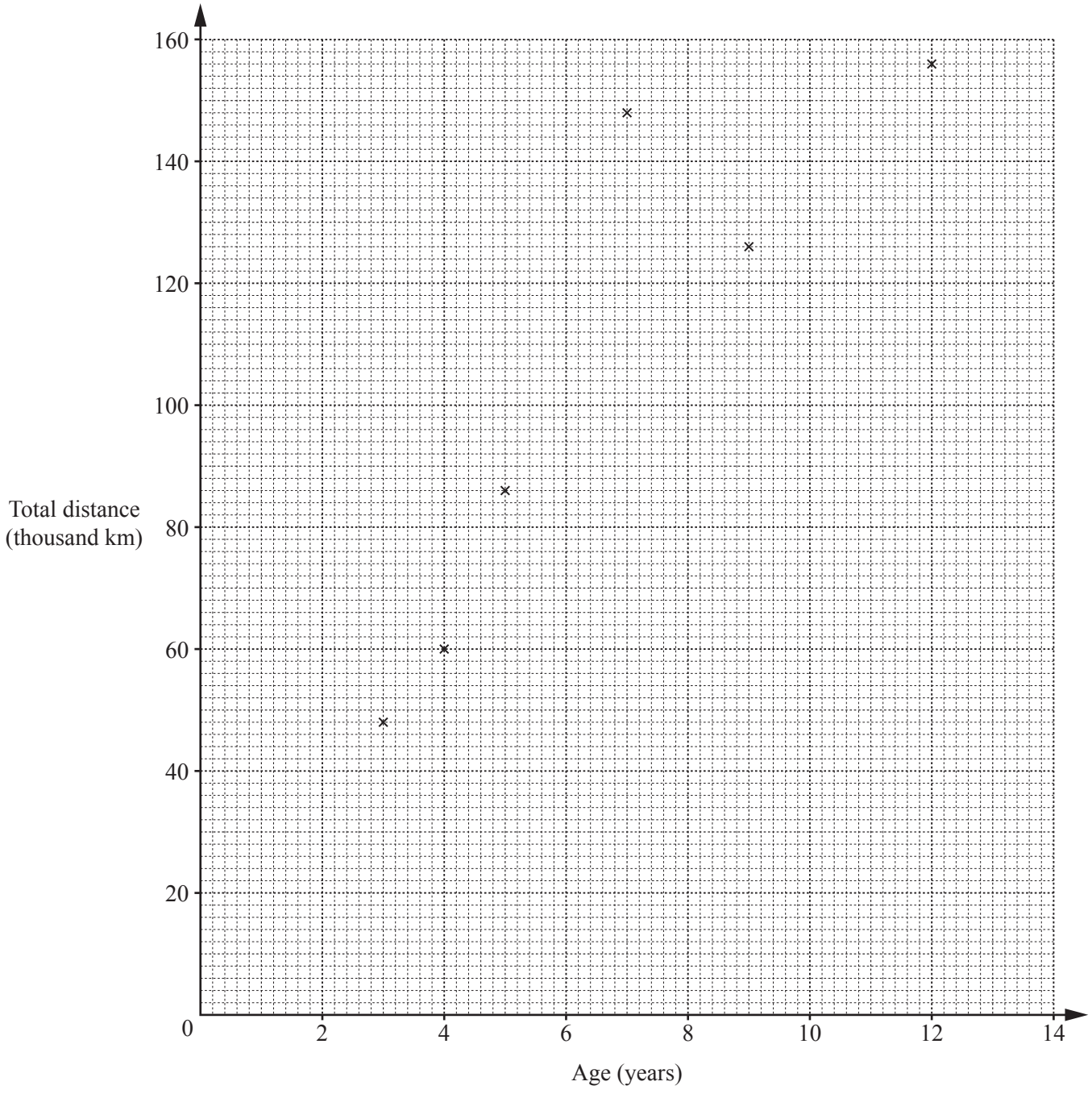
5 **(a)** The table shows the age and the total distance travelled for 10 cars.

Car	A	B	C	D	E	F	G	H	I	J
Age (years)	5	9	12	3	7	4	10	11	5	9
Total distance (thousand km)	86	126	156	48	148	60	70	150	105	138

(i) Find the mean age of the cars.

..... years [2]

(ii) Complete the scatter diagram.
The first six points have been plotted for you.



[2]

© UCLES 2016

(iii) What type of correlation does the scatter diagram show?

..... [1]

(iv) Draw the line of best fit on the scatter diagram. [1]

(v) Use your line of best fit to estimate the total distance travelled by a car that is 6 years old.

..... thousand km [1]

(vi) Car G travelled less than the average number of kilometres per year.

Explain how you know this from your scatter diagram.

..... [1]

(b) Juan is a car salesman.

(i) Last year, Juan sold 75 small cars, 45 medium cars and 30 large cars.

Find the ratio small cars : medium cars : large cars in its simplest form.

..... : ..... : ..... [2]

(ii) Ana wants to buy a car with a price of $2550.
Juan reduces the price by 12%.

Calculate the amount Ana pays for this car.

$..... [2]

(iii) Juan advertises a car for sale.

Plan A	Cash price $4500
OR	
Plan B	15% of the cash price plus 36 monthly payments of $120

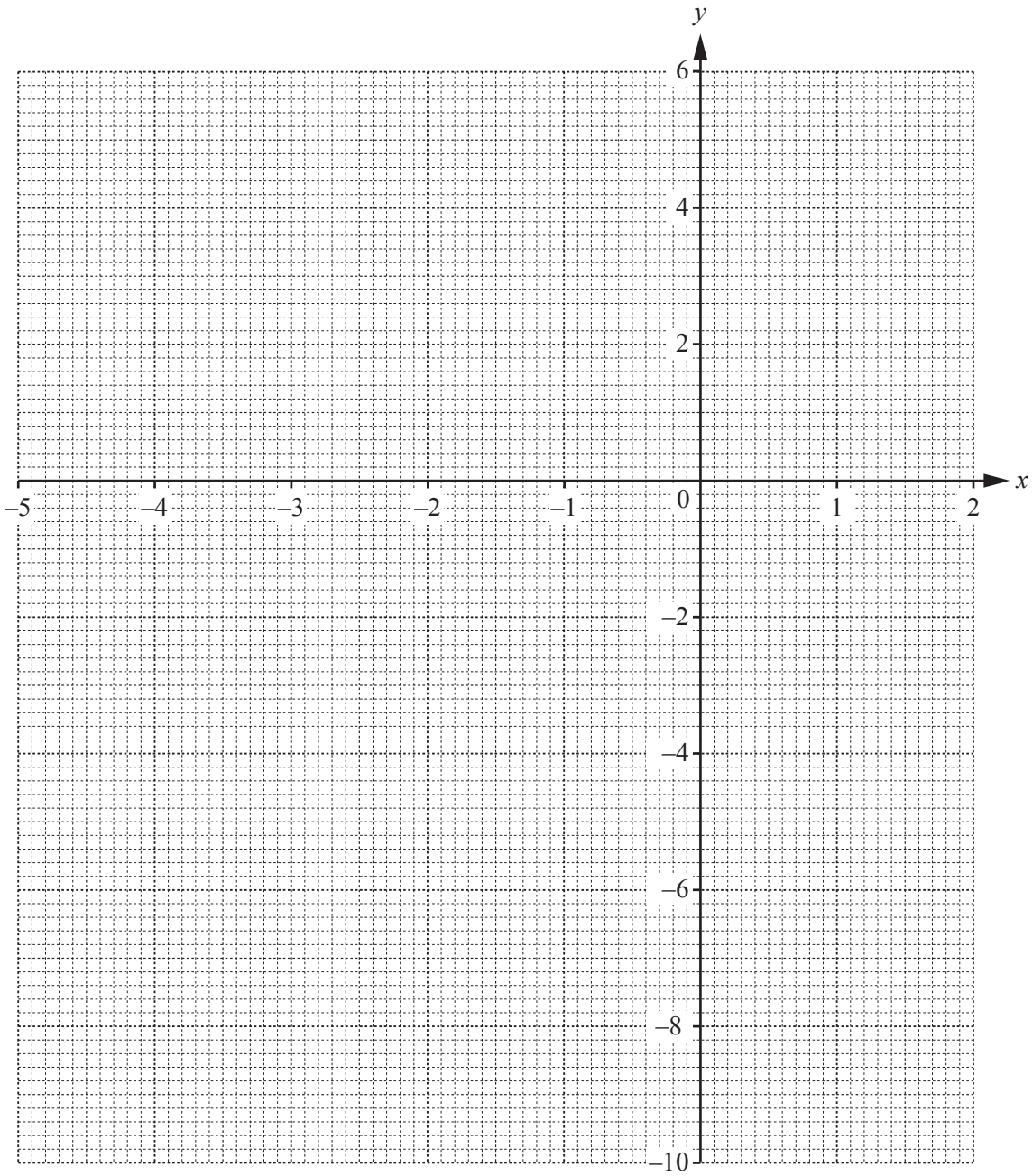
Work out how much more it costs to buy the car using Plan B than using Plan A.

$..... [3]

© UCLES 2016

[Turn over

6



(a) On the grid,

(i) draw the line $y = 3$, [1]

(ii) draw the line that is perpendicular to the line $y = 3$ that passes through the point $(1, -4)$. [2]

© UCLES 2016

(b) Complete the table of values for $y = 2 - 3x - x^2$.

x	−5	−4	−3	−2	−1	0	1	2
y		−2	2			2	−2	

[2]

(c) On the grid, draw the graph of $y = 2 - 3x - x^2$ for $-5 \leqslant x \leqslant 2$. [4]

(d) Write down the co-ordinates of the highest point of the graph of $y = 2 - 3x - x^2$.

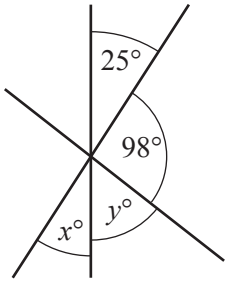
(..... , ...) [1]

(e) Use your graphs to solve the equation $2 - 3x - x^2 = 3$.

x = ... or x = ... [2]

© UCLES 2016

7 **(a)**



NOT TO SCALE

The diagram shows three straight lines crossing at a point.

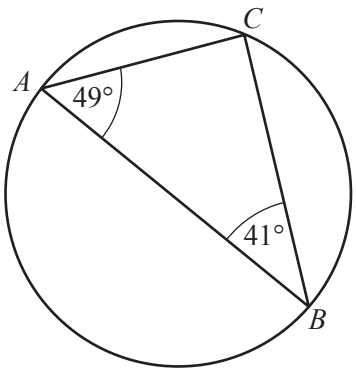
(i) Find the value of x.

$x =$ ..... [1]

(ii) Work out the value of y.

$y =$ ..... [1]

(b)



NOT TO SCALE

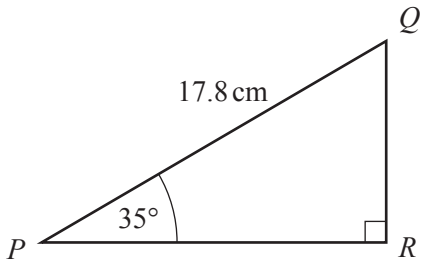
A, B and C are points on the circumference of a circle.

Explain why AB must be a diameter of the circle.

.....

..... [2]

(c)



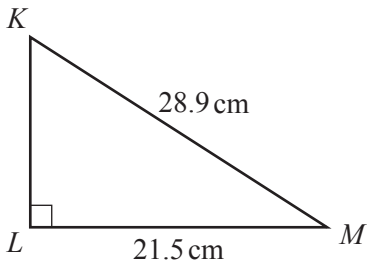
NOT TO SCALE

PQR is a right-angled triangle.

Use trigonometry to calculate *PR*.

PR = ... cm [2]

(d)



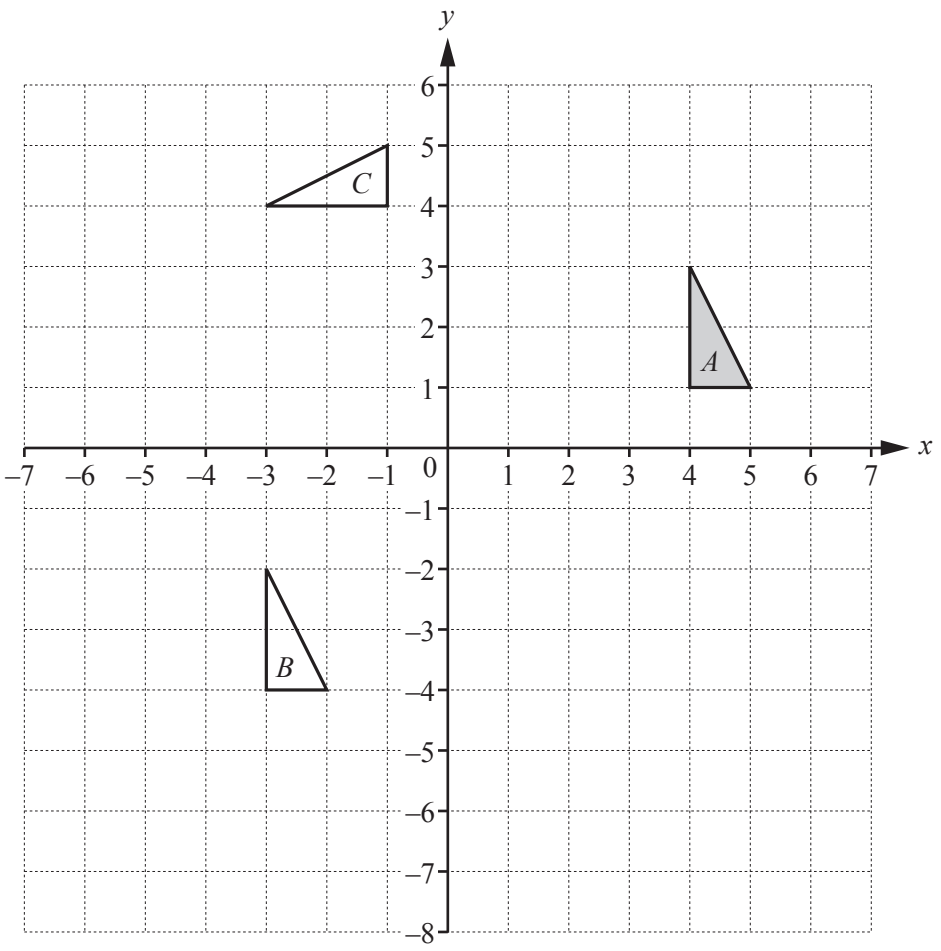
NOT TO SCALE

KLM is a right-angled triangle.

Calculate *KL*.

KL = ... cm [3]

8 (a)



(i) On the grid, draw the image of triangle A after a reflection in the line $y = -2$. [2]

(ii) Describe fully the **single** transformation that maps triangle A onto triangle B.

.....

..... [2]

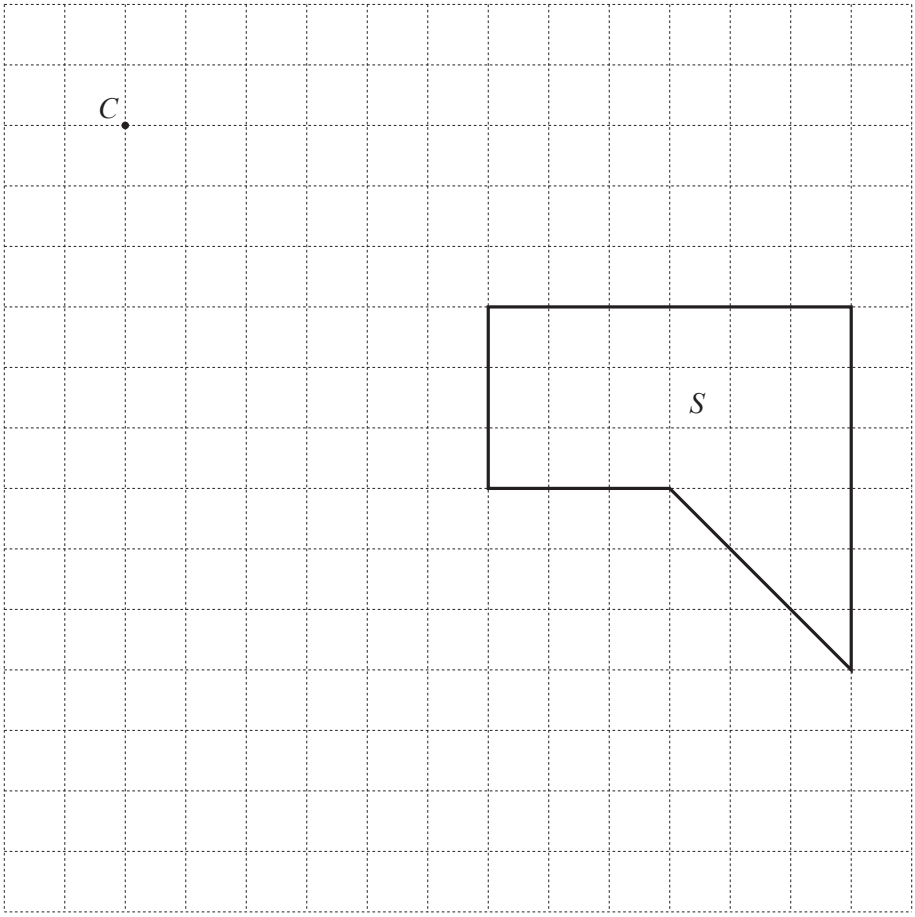
(iii) Describe fully the **single** transformation that maps triangle A onto triangle C.

.....

..... [3]

© UCLES 2016

(b) On the grid, draw the image of shape S after an enlargement with scale factor $\frac{1}{3}$, centre C.



[2]

9 **(a)** $p = 4r - 3t$

(i) Calculate the value of p when $r = 5$ and $t = -6$.

$p =$ ..... [2]

(ii) Make r the subject of the formula $p = 4r - 3t$.

$r =$ ..... [2]

(b) Expand the brackets and simplify.

$$4(3x - 2) - 3(x - 5)$$

..... [2]

(c) Factorise completely.

$$12ab - 20a^2$$

..... [2]

BLANK PAGE

© UCLES 2016

BLANK PAGE

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge International Examinations Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cie.org.uk after the live examination series.

Cambridge International Examinations is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.