Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

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.

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CAMBRIDGE International Examinations

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

View solution

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

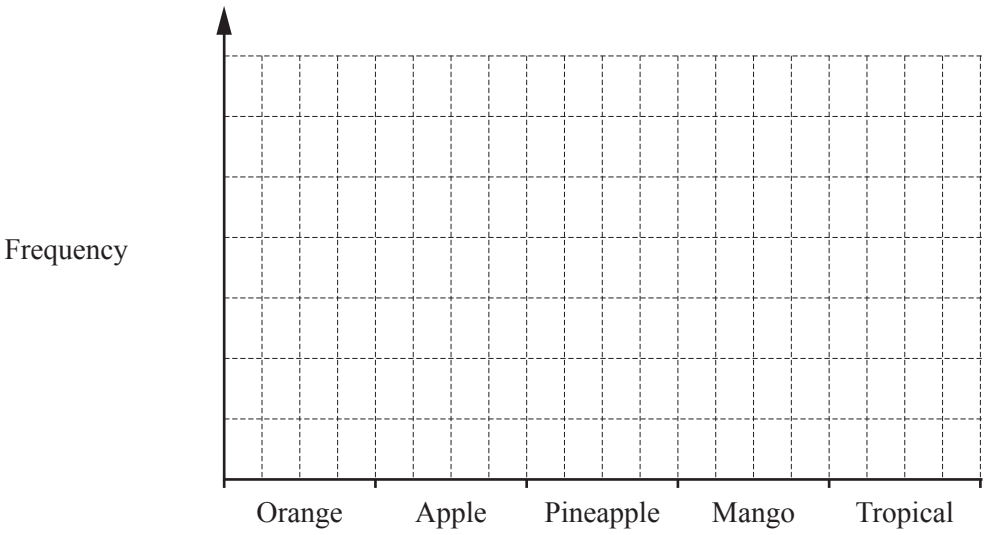
(i) Complete the frequency table for the results.
You may use the tally column to help you.

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.

View solution



[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.

View solution

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

..... [1]

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

View solution

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.

View solution

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.

View solution

Complete this statement about the value of j.

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

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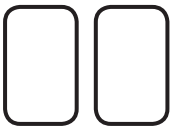
2 **(a)** Here are five number cards.

View solution



Place two cards side-by-side to show

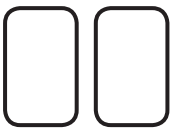
(i) a two-digit multiple of 7,



[1]

(ii) a two-digit square number,

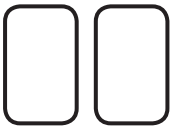
View solution



[1]

(iii) a two-digit cube number,

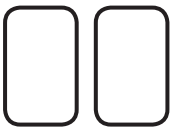
View solution



[1]

(iv) a two-digit prime number.

View solution



[1]

(b) $\sqrt{2}$ 5.85 4.1^2 π

View solution

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.

View solution

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

(d) Work out.

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

View solution

..... [1]

(ii) 5^4

View solution

..... [1]

(iii) 4^{-2}

View solution

..... [1]

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

View solution

..... [2]

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

View solution

..... [2]

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

View solution

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.

View solution

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.

View solution

..... min [1]

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

View solution

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

..... km/h [1]

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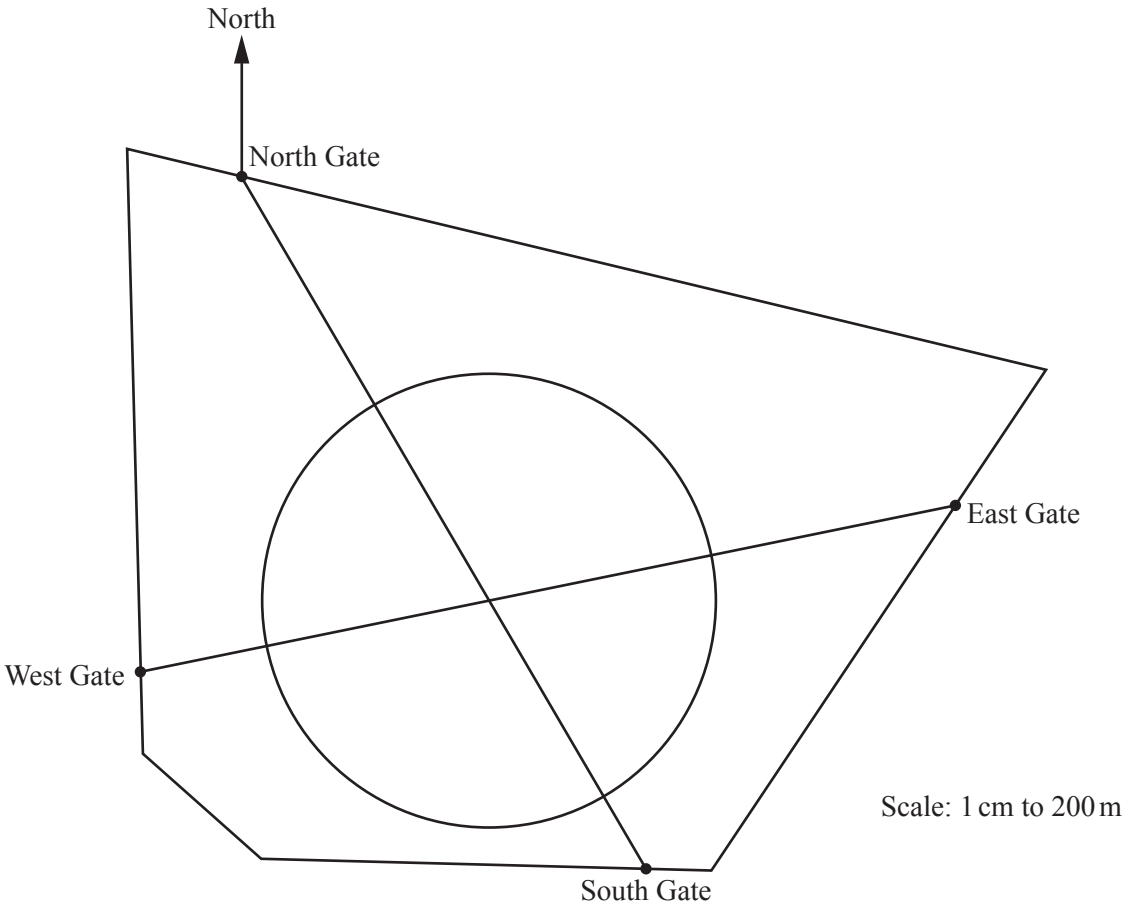
(c) The scale drawing shows a map of Kingswood Park.
There are two straight paths and one circular path.
The scale is 1 centimetre represents 200 metres.

View solution



(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]

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

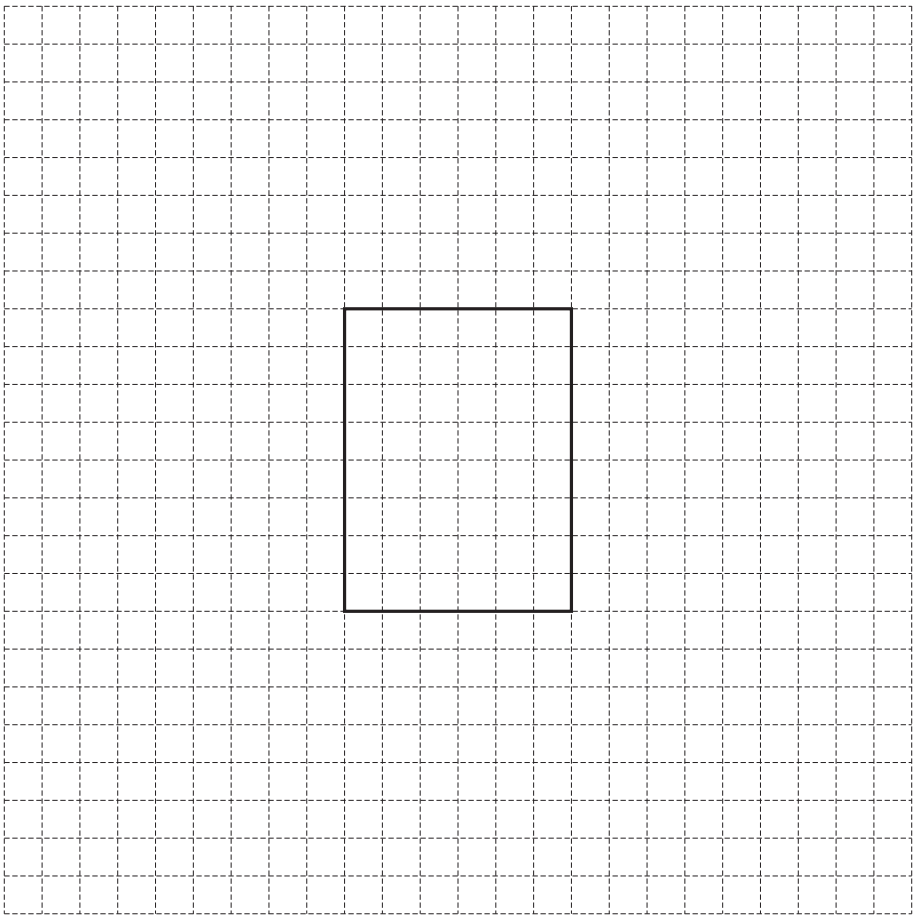
View solution

(i) Calculate the volume of the cuboid.

..... cm^3 [2]

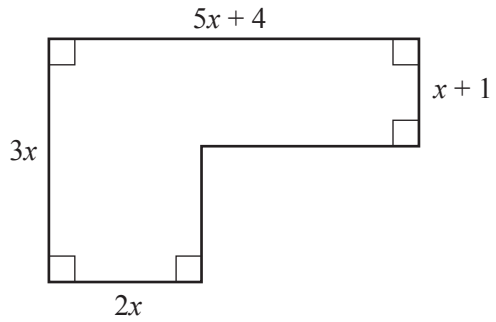
View solution

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



[3]

(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]

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

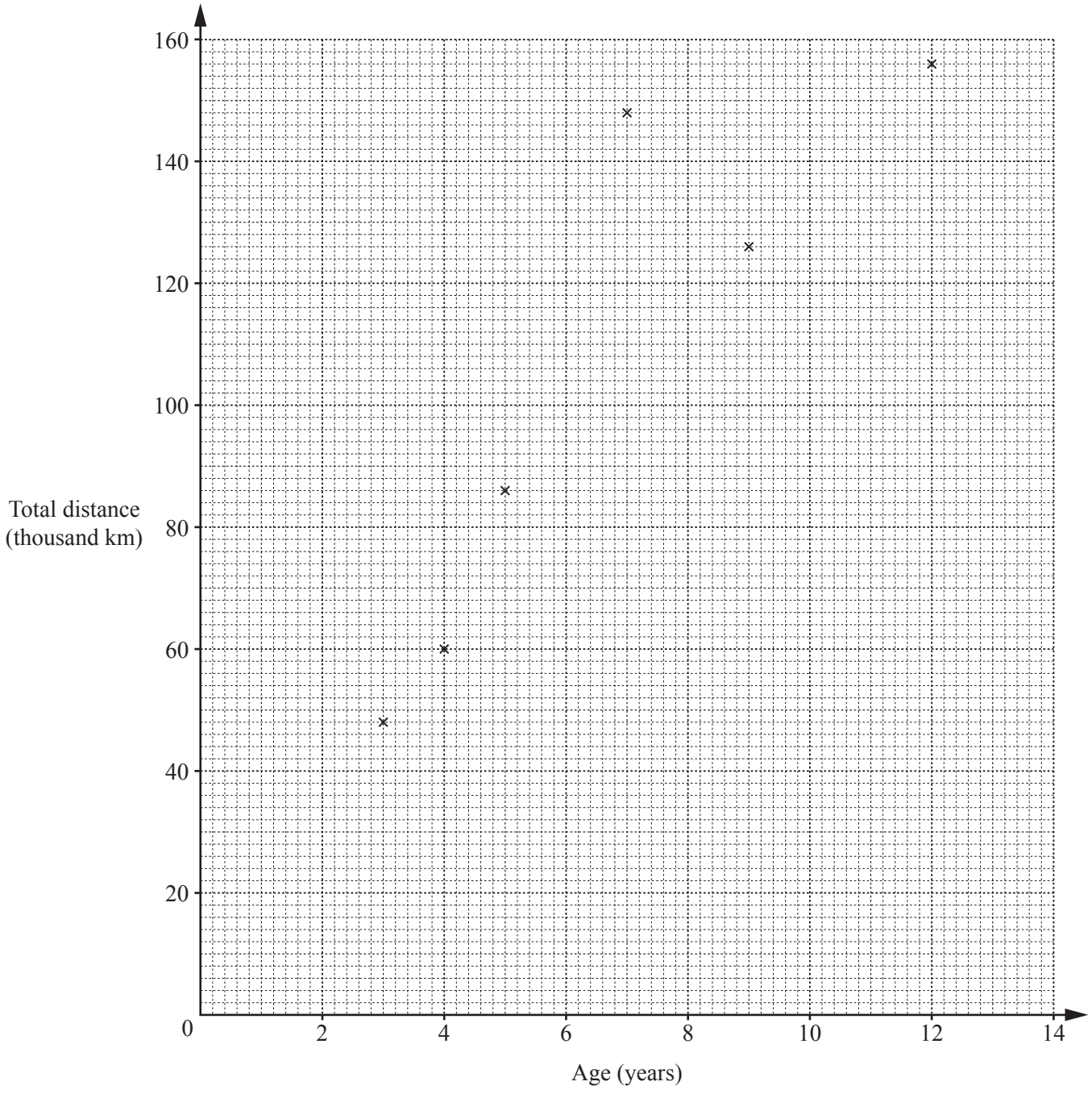
View solution

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]

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(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.

View solution

(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]

View solution

(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]

View solution

(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]

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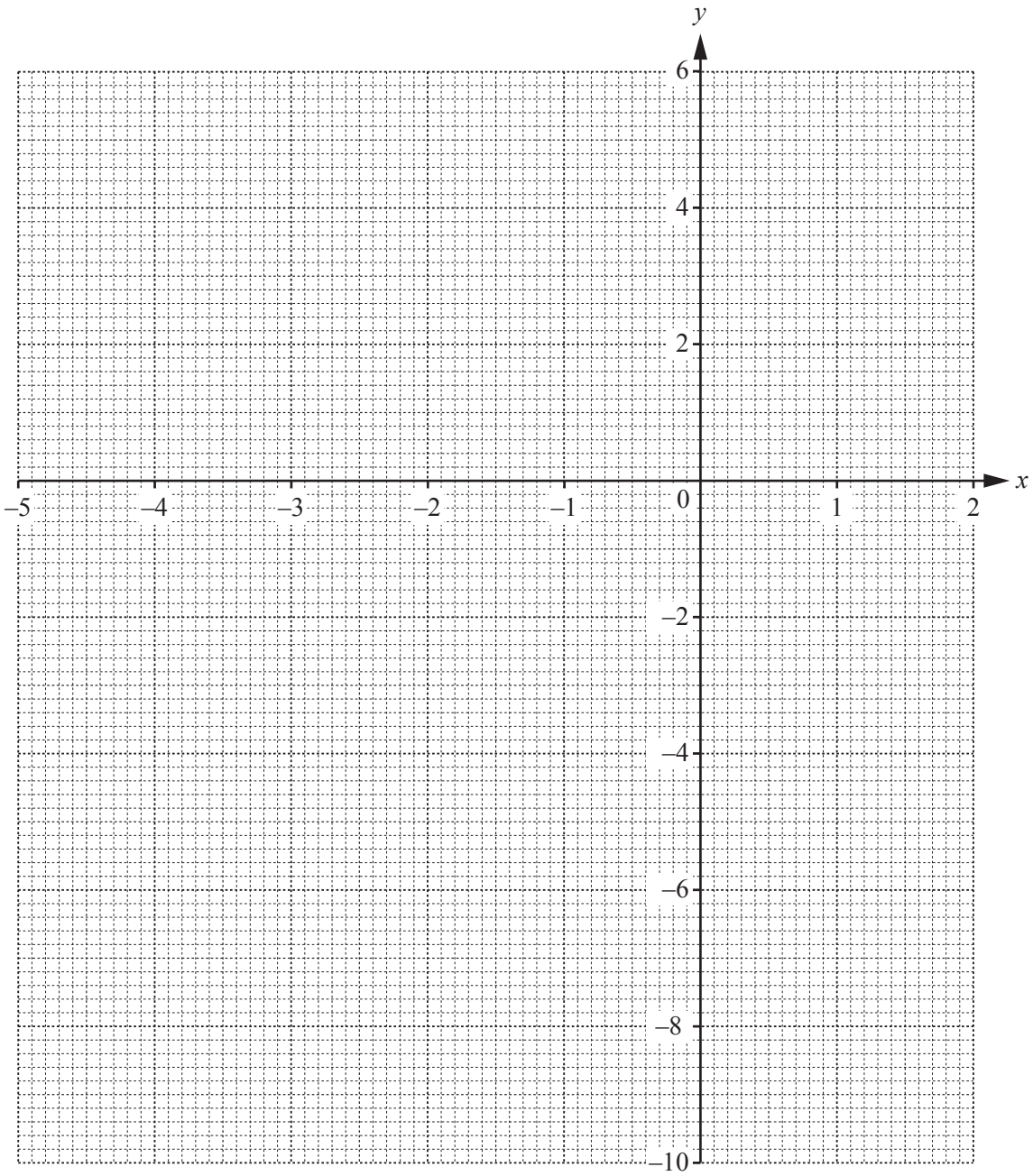
6



View solution

(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]

View solution

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

View solution

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]

View solution

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

View solution

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

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

View solution

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

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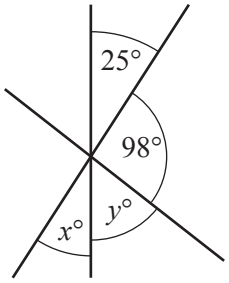
7 **(a)**



NOT TO SCALE

The diagram shows three straight lines crossing at a point.

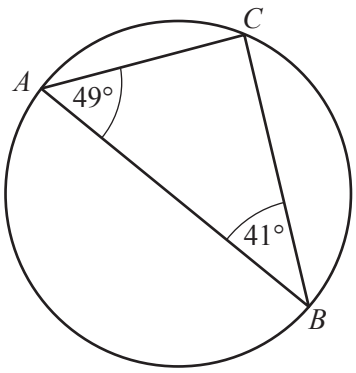
(i) Find the value of x.

$x =$ ..... [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.

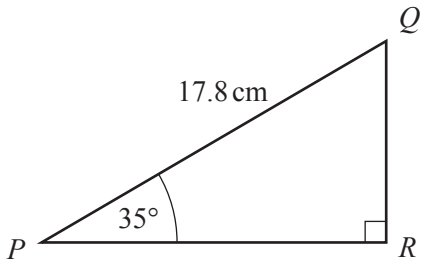
Explain why AB must be a diameter of the circle.

.....

..... [2]

(c)

View solution



NOT TO SCALE

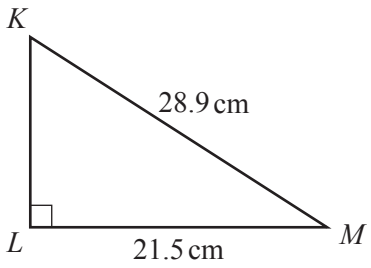
PQR is a right-angled triangle.

Use trigonometry to calculate *PR*.

PR = ... cm [2]

(d)

View solution



NOT TO SCALE

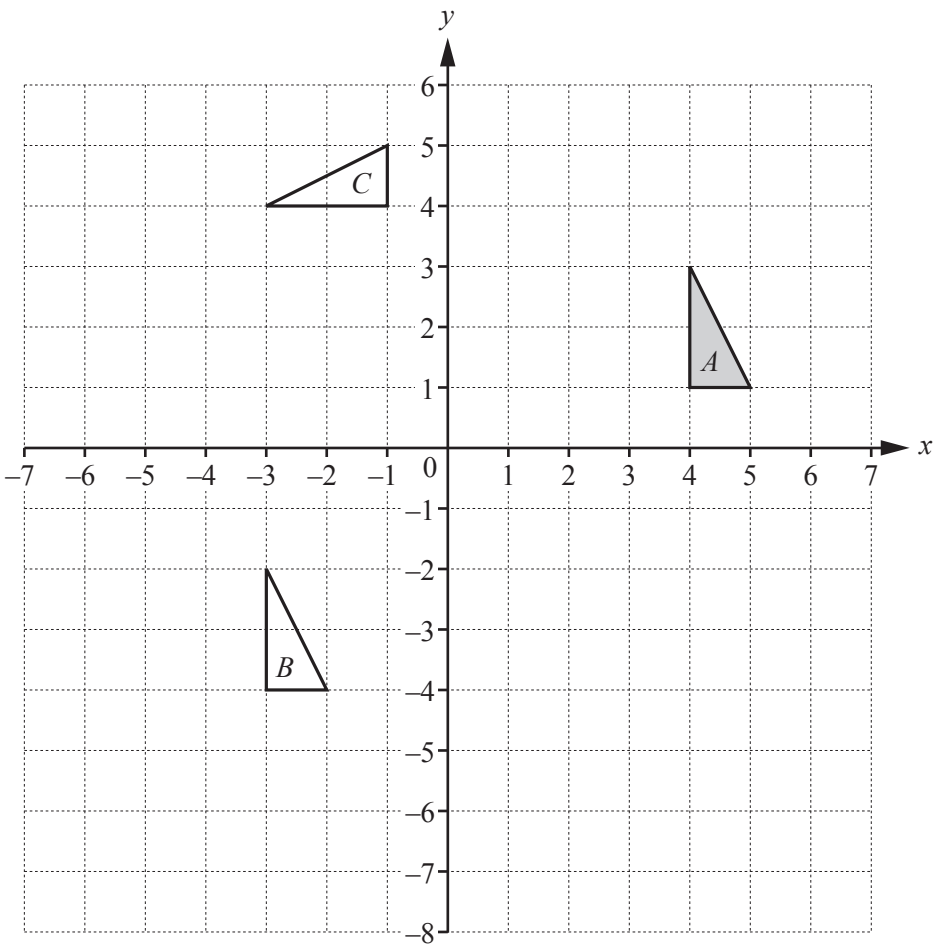
KLM is a right-angled triangle.

Calculate *KL*.

KL = ... cm [3]

8 (a)

View solution



(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.

View solution

.....

..... [2]

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

View solution

.....

..... [3]

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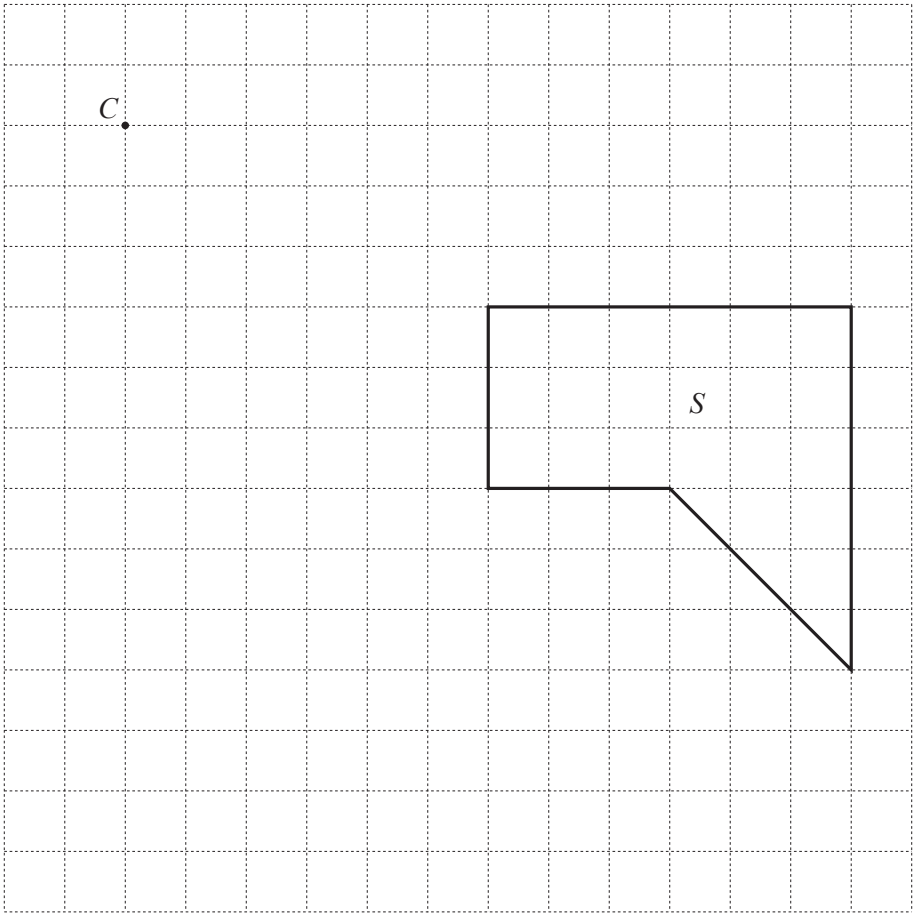
(b) On the grid, draw the image of shape S after an enlargement with scale factor $\frac{1}{3}$, centre C.

View solution



[2]

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

View solution

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

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

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

View solution

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

(b) Expand the brackets and simplify.

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

View solution

..... [2]

(c) Factorise completely.

$$12ab - 20a^2$$

View solution

..... [2]

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