Cambridge IGCSE

Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

7998121363

MATHEMATICS **0580/32**

Paper 3 (Core) **February/March 2019**

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.

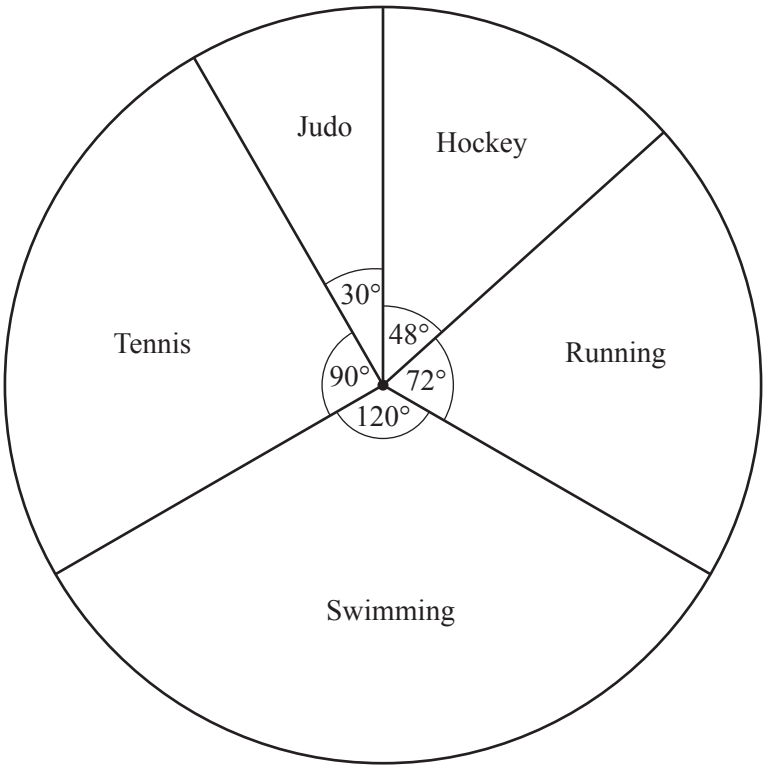
Answer **all** questions.
If working is needed for any question it must be shown below that question.
Electronic calculators should be used.
If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees 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.

This document consists of **19** printed pages and **1** blank page.

Cambridge Assessment International Education

1 **(a)** 60 boys are asked to name their favourite sport.
The results are shown in the pie chart.



(i) Write down the most popular sport.

..... [1]

(ii) Write down the fraction of boys who choose Running.

..... [1]

(iii) Work out how many boys choose Judo.

..... [2]

(iv) One of the boys is chosen at random.

Work out the probability that his favourite sport is **not** Judo.

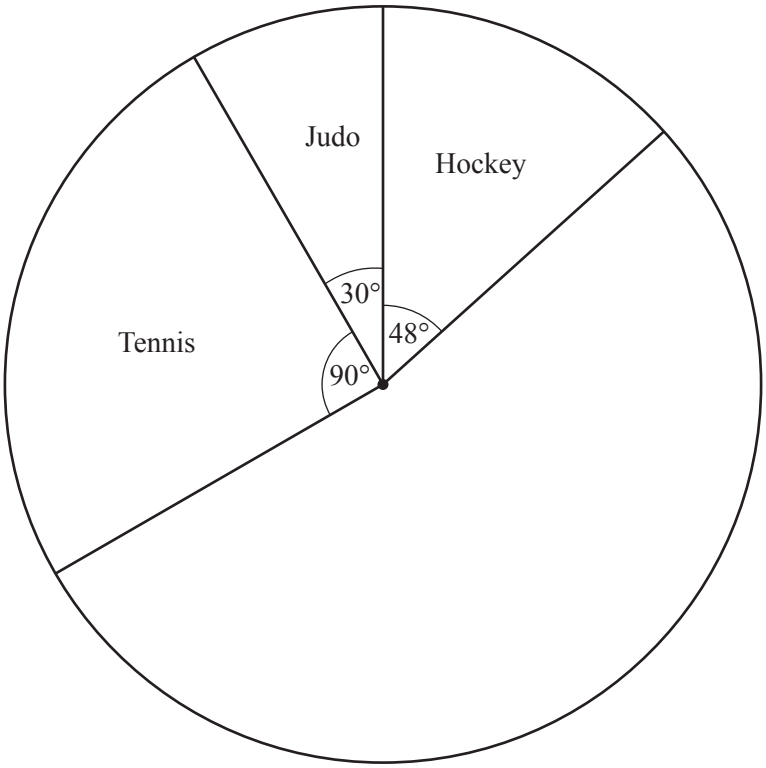
..... [1]

(v) Complete this statement.

Three times as many boys choose ..... than choose ..... [1]

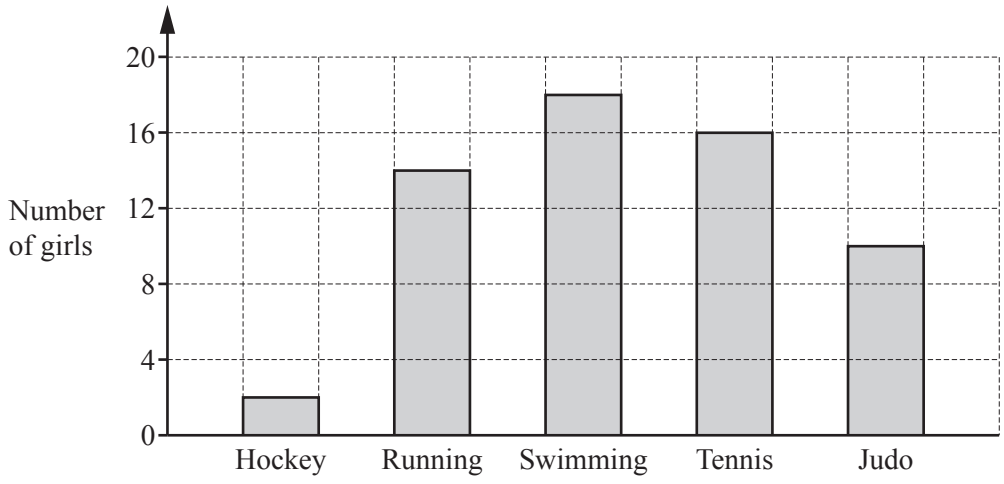
(b) Two of the boys in **part (a)** then change their choice from Running to Swimming.

Complete the pie chart after this change.
The Tennis, Judo and Hockey sectors have been drawn for you.



[2]

(c) 60 girls are asked to name their favourite sport.
Their results are shown in the bar chart below.

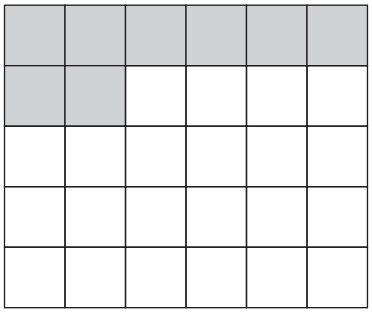


Using your pie chart in **part (b)** and the bar chart above, write down one similarity and one difference between the girls' results and the boys' results.

Similarity .....

Difference ..... [2]

2 (a)



Write down the fraction of the rectangle that is shaded.
Give your answer in its simplest form.

..... [2]

(b) Write down a fraction that is equivalent to $\frac{7}{12}$.

..... [1]

(c) Write down a fraction that completes this calculation.

$$\frac{13}{11} \times \frac{\text{.....}}{\text{.....}} = 1$$

[1]

(d) Find a fraction that makes this statement true.

$$\frac{7}{9} < \frac{\text{.....}}{\text{.....}} < \frac{8}{9}$$

[1]

(e) Write these numbers in order, starting with the smallest.

5.7×10^{-1} $\quad \frac{4}{7} \quad$ $\sqrt{0.33}$ $\quad$ 57.2%

..... < ..... < ..... < ..... [2]
smallest

3 **(a)** Maia shares $3000 between her three children.
She gives the eldest child $1200, the second eldest child $1000 and the rest to the youngest child.

Write this information as a ratio in its simplest form.

..... : ..... : ..... [2]
eldest *youngest*

(b) Yani's house is for sale.
She decides to reduce the selling price of $240 000 by 15%.

Calculate the new selling price.

$ ..... [2]

(c) Hawa invests $750 at a rate of 3.5% per year compound interest.

Calculate the value of his investment at the end of 3 years.

$ ..... [3]

4 A car park has 880 parking spaces.

(a) Some of the spaces are reserved.
The ratio of reserved spaces : not reserved spaces = 1 : 10.

Work out the number of spaces that are not reserved.

..... [2]

(b) 25% of the 880 spaces are on the top floor.

Work out the number of spaces that are on the top floor.

..... [1]

(c) At 06 00 one morning, $\frac{1}{40}$ of the 880 spaces are filled.
By 06 30, no cars have left the car park but another $\frac{1}{5}$ of the 880 spaces are filled.

Work out the fraction of the 880 spaces that are empty at 06 30.

..... [3]

(d) The cost of each visit to the car park is shown in the table.

Length of visit	Cost ($)
Up to 20 minutes	Free
More than 20 minutes and up to 2 hours	2.50
More than 2 hours and up to 4 hours	4.50
More than 4 hours and up to 8 hours	8.50
More than 8 hours and up to 24 hours	12.00

(i) Samarth arrives at 11 40 and leaves at 15 30.

Find the cost of his visit.

$ ..... [1]

(ii) Radhika leaves the car park at 17 50 and pays $8.50 .

(a) Work out the earliest time she could have arrived at the car park.

..... [1]

(b) Work out the change she receives from a $20 note.

$ ..... [1]

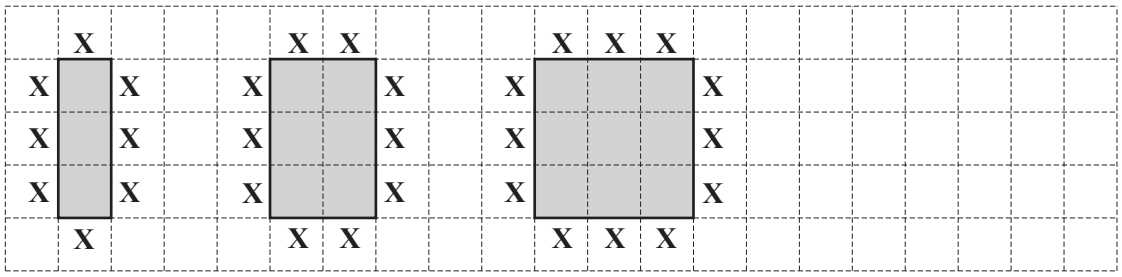
(iii) Dhruv bought a weekly car park ticket for $26.
That week, he visited the car park four times.
These are the lengths of time he parked his car for.

17 minutes $6\frac{1}{2}$ hours 11 hours $9\frac{1}{4}$ hours

Work out how much he saved by buying a weekly ticket.

$ ..... [3]

5 Mrs Verma has a restaurant.
In the restaurant each table has 8 chairs.
Sometimes she puts tables together.
The diagrams show how the tables are put together and the position of each chair (**X**).



1 table 2 tables 3 tables 4 tables

The pattern of tables and chairs forms a sequence.

(a) Draw the diagram for 4 tables. [1]

(b) Complete the table.

Number of tables (t)	1	2	3	4	5	6
Number of chairs (c)	8	10	12			

[2]

(c) Find a formula for the number of chairs, c, in terms of the number of tables, t.

$c =$ ..... [2]

(d) 18 tables are put together in this way.

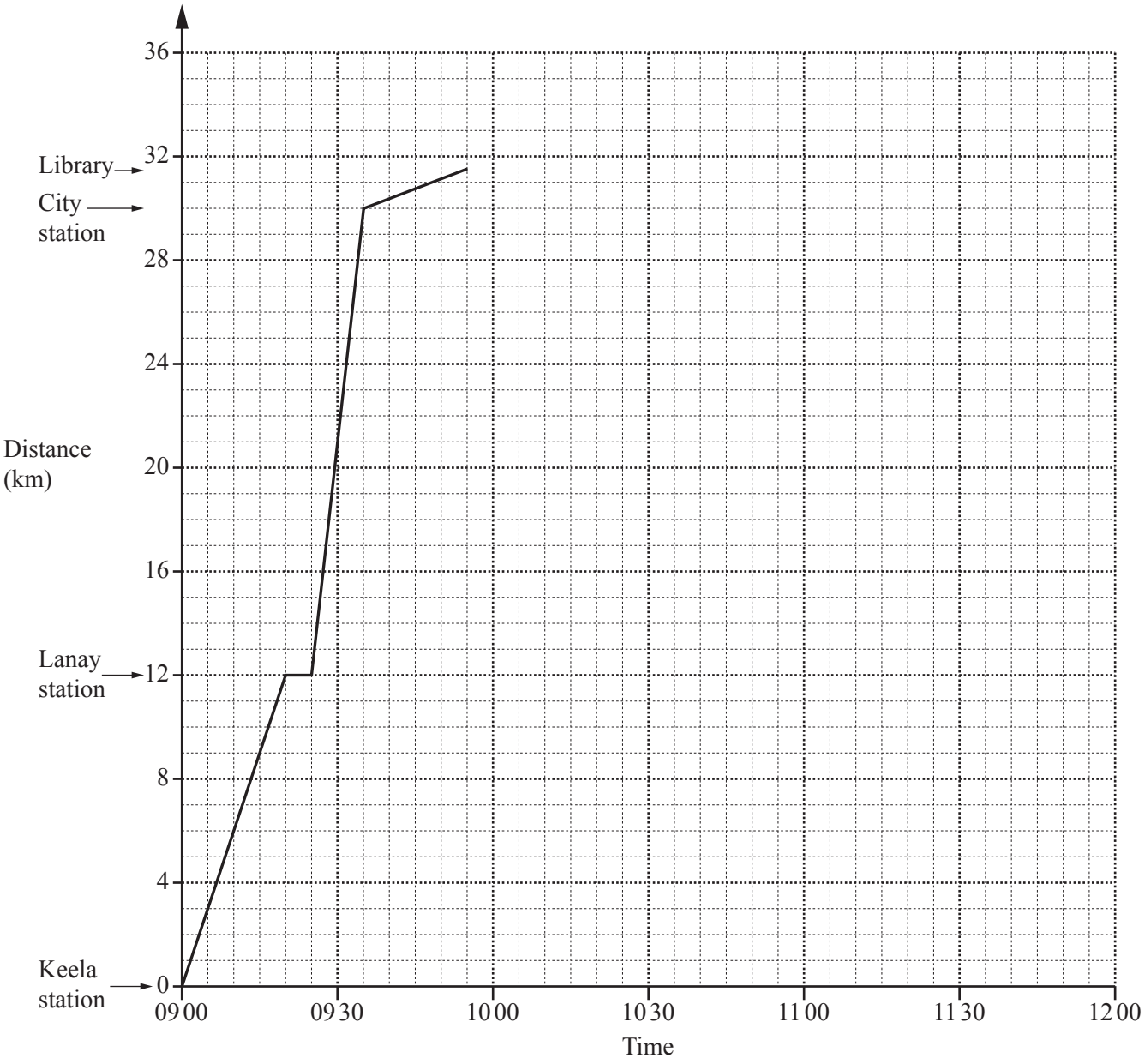
Work out the number of chairs needed.

..... [2]

(e) Work out the number of tables, put together in this way, when 80 chairs are needed.

..... [2]

6 Mr Patel is travelling by train to the city.
He is going to the library.



The travel graph shows his journey from Keela station to the library.

(a) Write down the total time it takes Mr Patel to travel from Keela station to the library.

..... min [1]

(b) Work out the speed of the train between Lanay station and City station in km/h.

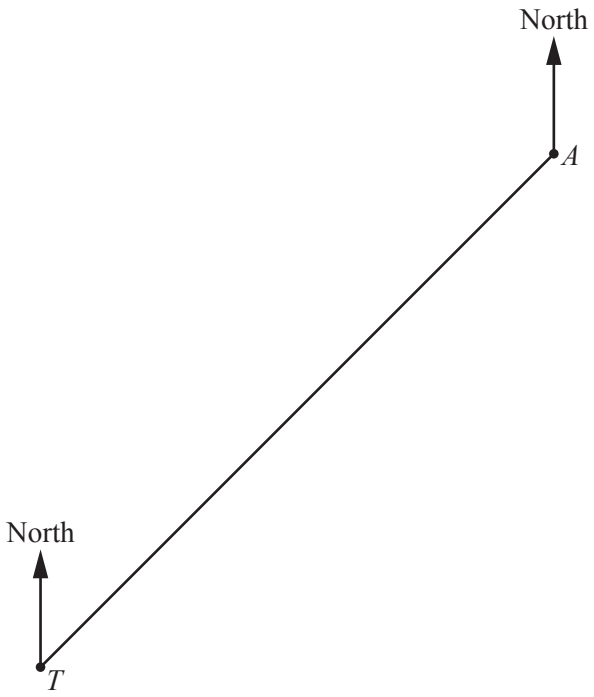
..... km/h [2]

(c) Use the following information to complete the travel graph for Mr Patel.

- He spends 35 minutes at the library.
- He walks back to City station at the same constant speed he walked to the library.
- The train takes 20 minutes to travel from City station to Lanay station.
- The train stops for 10 minutes at Lanay station.
- The train travels at a constant speed of 48 km/h from Lanay station to Keela station.

[4]

7 The scale drawing shows the positions of an airport (A) and a train station (T) on a map.
The scale is 1 centimetre represents 2 kilometres.



Scale: 1 cm to 2 km

(a) Work out the actual distance, in kilometres, of the train station from the airport.

..... km [2]

(b) Measure the bearing of the airport from the train station.

..... [1]

(c) There is a straight road that is equidistant from *T* and *A*.

Using a straight edge and compasses only, construct the position of the road on the map.
Show all your construction arcs. [2]

(d) Krishna's house is

- on a bearing of 203° from the airport

and

- 8.8 km from the train station.

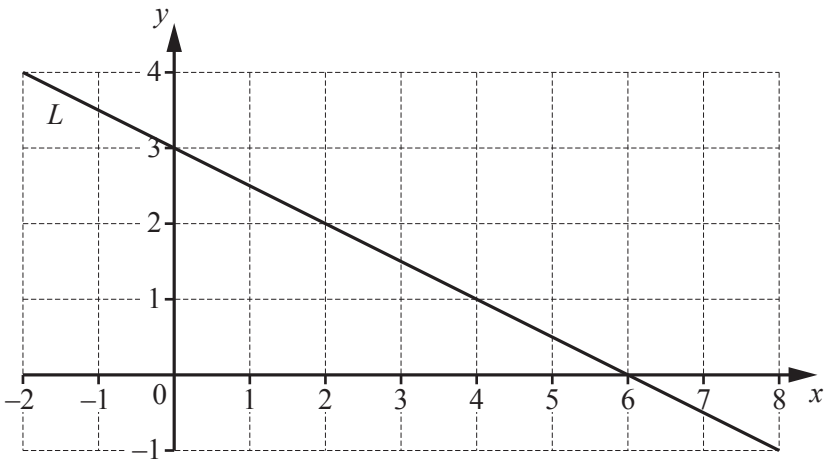
On the map, mark the two possible positions of Krishna's house.
Label each of these points *K*. [4]

(e) The bus station is not shown on the map.
The bearing of the bus station from the train station is 318°.

Work out the bearing of the train station from the bus station.

..... [2]

8 (a)



Line L is drawn on the grid.

Find the equation of line L.
Give your answer in the form $y = mx + c$.

$y =$ ..... [3]

(b) The points $(9, a)$ and $(b, 3)$ lie on the line $y = \frac{2}{3}x - 7$.

Work out the value of

(i) a,

$a =$ ..... [2]

(ii) b.

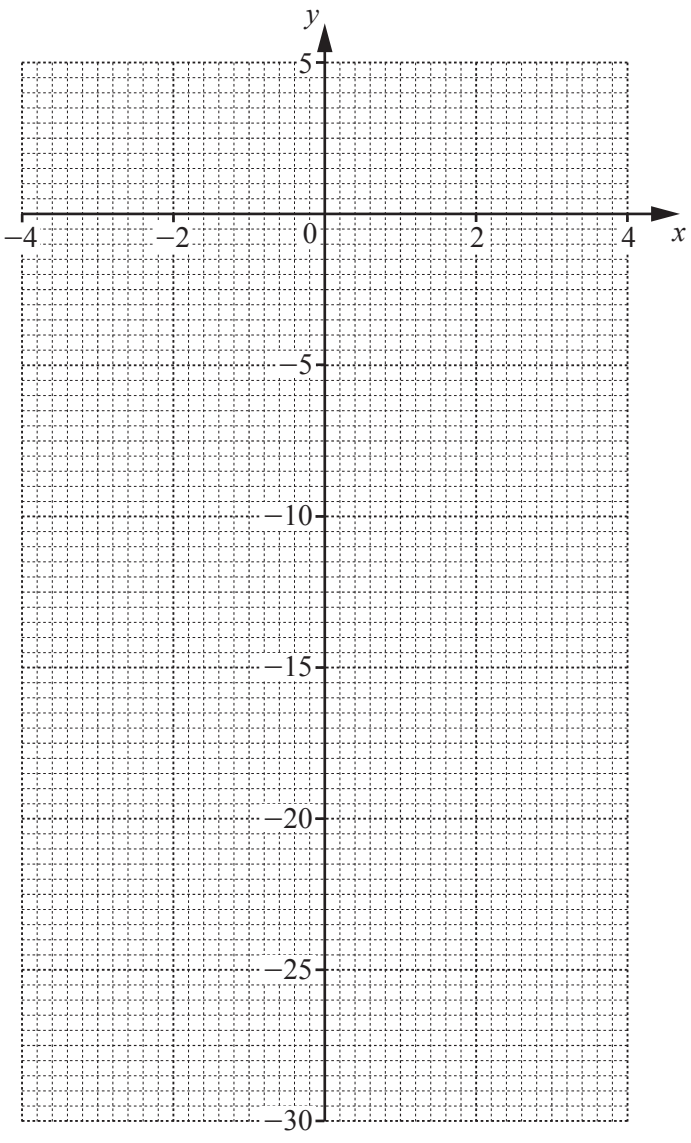
$b =$ ..... [2]

(c) **(i)** Complete the table of values for $y = x(3-x)$.

x	-4	-2	-1	0	1	2	4
y		-10		0	2		-4

[3]

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

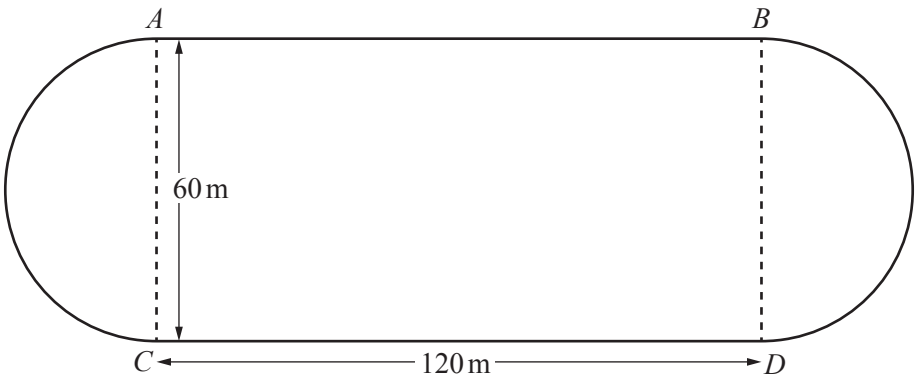


[4]

(iii) Write down the co-ordinates of the highest point of the graph for $-4 \leqslant x \leqslant 4$.

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

9 The diagram shows a rectangle and two semicircles with diameters AC and BD.
This diagram is a scale drawing of a running track.
$AC = BD = 60\,\text{m}$
$AB = CD = 120\,\text{m}$



(a) (i) Complete the statement.

1 centimetre represents ..... metres. [2]

(ii) Work out the total length of the running track in metres.

..... m [3]

(iii) Shreva walks at 1.4 m/s.

Work out how long it will take her to walk once around the track.
Give your answer in minutes and seconds, correct to the nearest second.

..... minutes ..... seconds [3]

(b) Talan completes one lap of the track every 80 seconds.

(i) Work out how many laps he can complete in one hour.

..... [2]

(ii) Naima completes one lap of the track every 88 seconds.
Talan and Naima start running from point *A* on the track at the same time.
They each complete a number of laps of the track.

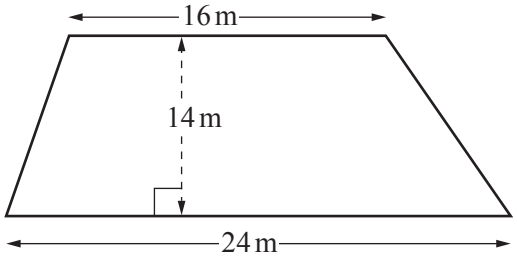
Work out the smallest number of laps they each complete before they are both at point *A* again at the same time.

Talan completes ..... laps and Naima completes ..... laps. [3]

10 (a) **Using a straight edge and compasses only**, construct the equilateral triangle *ABC*.
The base *AB* has been drawn for you.

[2]

(b)



NOT TO SCALE

Calculate the area of this trapezium.

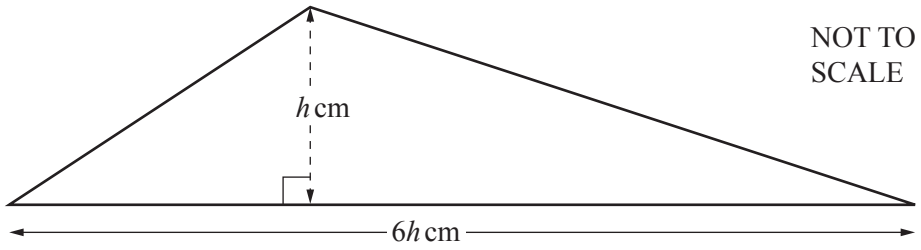
..... m^2 [2]

(c) Each interior angle of a regular polygon is 162°.

Calculate the number of sides of the polygon.

..... [3]

(d)



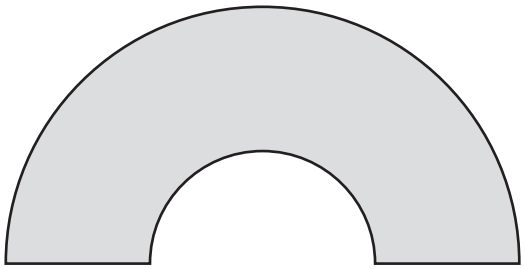
NOT TO SCALE

The area of this triangle is 363 cm^2.

Calculate the value of h.

$h =$ ..... [3]

(e)



NOT TO SCALE

This shape is drawn using two semicircles that have the same centre.
The large semicircle has radius 7 cm.
The small semicircle has radius 3 cm.

Calculate the area of the shape.

..... cm^2 [3]

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