Cambridge IGCSE

Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

MATHEMATICS **0580/33**

Paper 3 (Core) **May/June 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 **16** printed pages.

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1 **(a)** Write this number in figures.

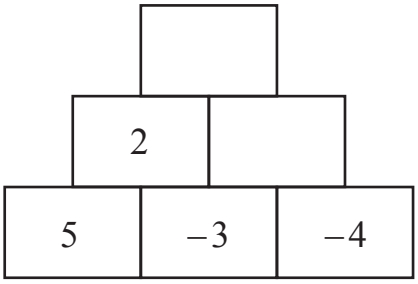
One million three hundred and two thousand five hundred and ninety-six.

View solution

..... [1]

(b) **(i)** Two numbers are **added** together to give the number in the box immediately above.

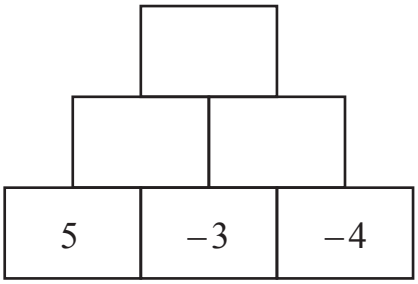
View solution



Complete the diagram. [2]

(ii) Two numbers are **multiplied** together to give the number in the box immediately above.

View solution



Complete the diagram. [3]

(c) Write these in order of size, starting with the smallest.

View solution

$\frac{5}{27}$ 18.4% 1.83×10^{-1} 5^{-1}

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

smallest

(d) Work out 142 as a percentage of 304.

View solution

..... % [1]

(e) **(i)** Find the highest common factor (HCF) of 28 and 98.

View solution

..... [2]

(ii) Find the lowest common multiple (LCM) of 28 and 98.

View solution

..... [2]

(f) The average distance from Earth to Mars is 2.25×10^8 km.
A space ship travels from Earth to Mars at an average speed of 5.8×10^4 km/h.

Find how long, in hours, the journey takes.

View solution

..... hours [2]

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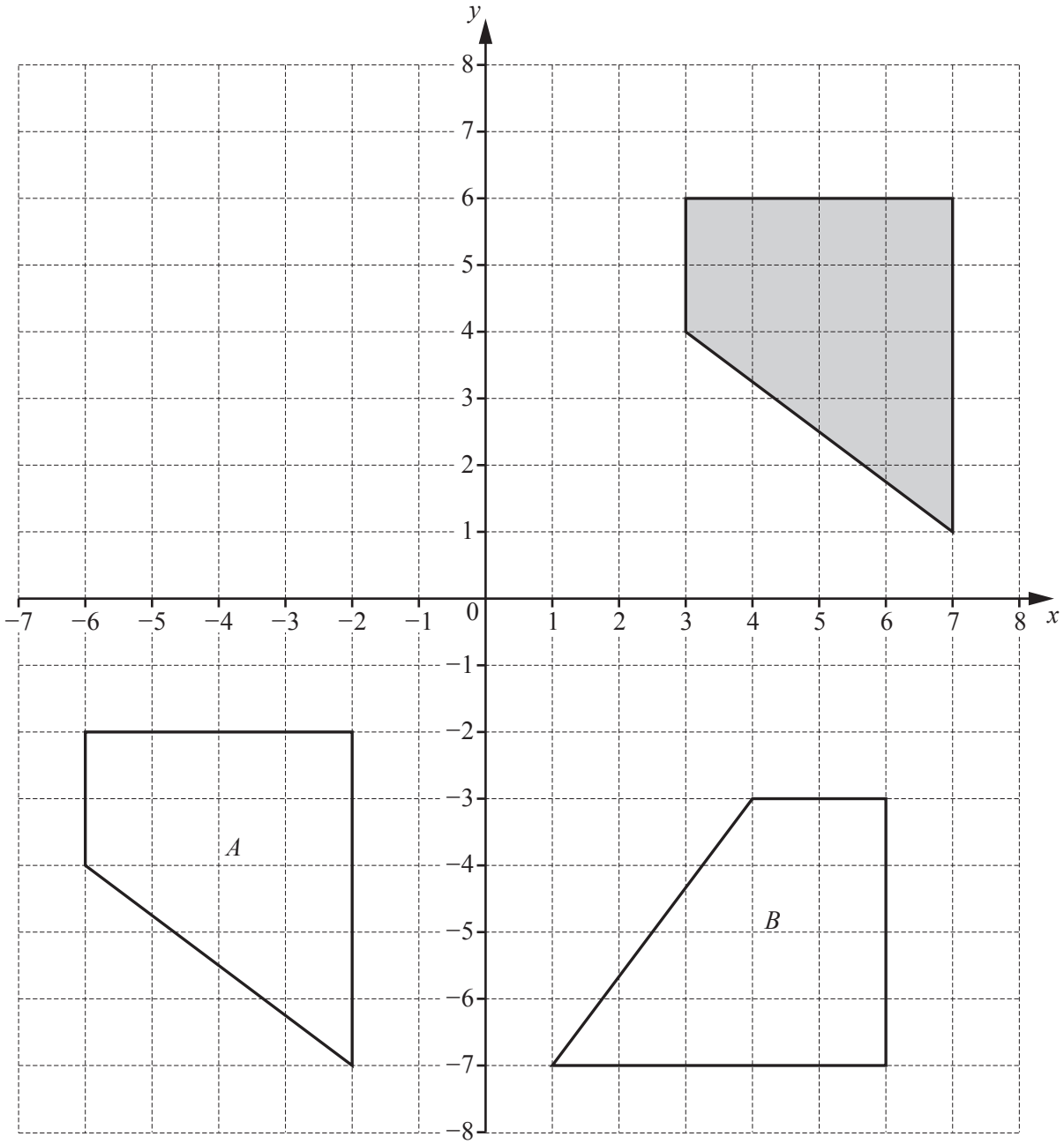
2 Three quadrilaterals are shown on a 1 cm^2 grid.



(a) Write down the mathematical name of the shaded quadrilateral.

View solution

..... [1]

(b) For the shaded quadrilateral

(i) **measure** the perimeter,

View solution

..... cm [1]

(ii) work out the area.

View solution

..... cm^2 [1]

(c) Describe fully the **single** transformation that maps the shaded quadrilateral onto

View solution

(i) quadrilateral A,

.....

..... [2]

(ii) quadrilateral B.

View solution

.....

..... [3]

(d) On the grid,

View solution

(i) reflect the shaded quadrilateral in the line $x = 1$, [2]

(ii) enlarge the shaded quadrilateral by scale factor $\frac{1}{2}$, centre $(-1, 0)$. [2]

View solution

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3 The music teacher at a school forms an orchestra.
The instruments in the orchestra are 36 string, 15 woodwind and 12 brass.

(a) Write the ratio string : woodwind : brass in its simplest form.

View solution

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

(b) The 36 string instruments are violins, cellos and double basses in the ratio

View solution

violins : cellos : double basses = 9 : 2 : 1.

(i) Show that the number of violins is 27.

[1]

(ii) Work out the number of cellos and the number of double basses.

View solution

Cellos .....

Double basses ..... [2]

(c) The 15 woodwind instruments are oboes, flutes and clarinets.
20% of these instruments are oboes.
There are twice as many flutes as clarinets.

View solution

Find the number of flutes.

..... [2]

(d) Of the 12 brass instruments, $\frac{1}{3}$ are trumpets, 3 are trombones and the remainder are horns.

View solution

Find the number of horns.

..... [2]

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(e) The music teacher needs to buy all the instruments for the orchestra.

View solution

	Number of instruments	Price of each instrument ($)	Cost ($)
String	36	131	4716
Woodwind	15	217	
Brass	12	221	

(i) Complete the table. [1]

(ii) Find the total cost of all the instruments.

View solution

$ ..... [1]

(f) The school is given 65% of the total cost of all the instruments.

View solution

Find how much more money is needed.

$ ..... [2]

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4 **(a)** Complete the table of values for $y = 5 + 2x - x^2$.

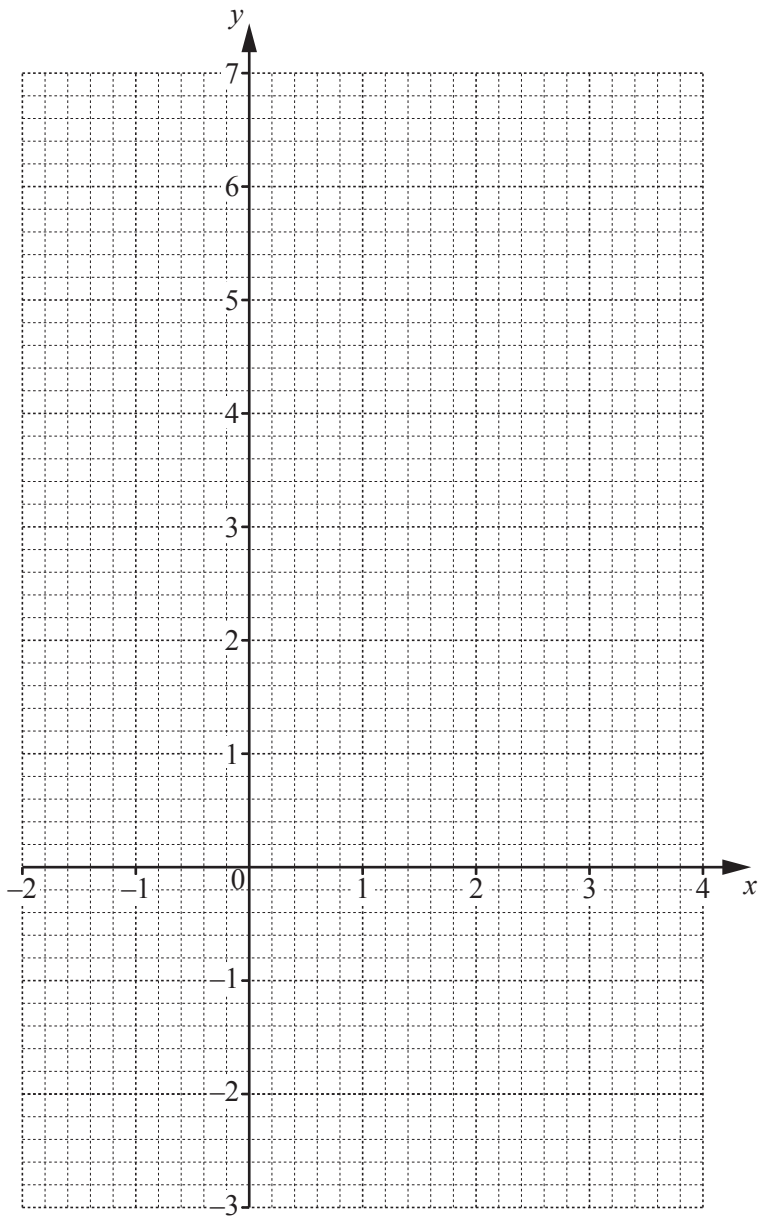
View solution

x	-2	-1	0	1	2	3	4
y		2	5	6			-3

[2]

(b) On the grid, draw the graph of $y = 5 + 2x - x^2$ for $-2 \leqslant x \leqslant 4$.

View solution



[4]

(c) **(i)** On the grid, draw the line of symmetry. [1]

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

View solution

..... [1]

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(d) Use your graph to find the solutions of the equation $5+2x-x^2=4$.

View solution

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

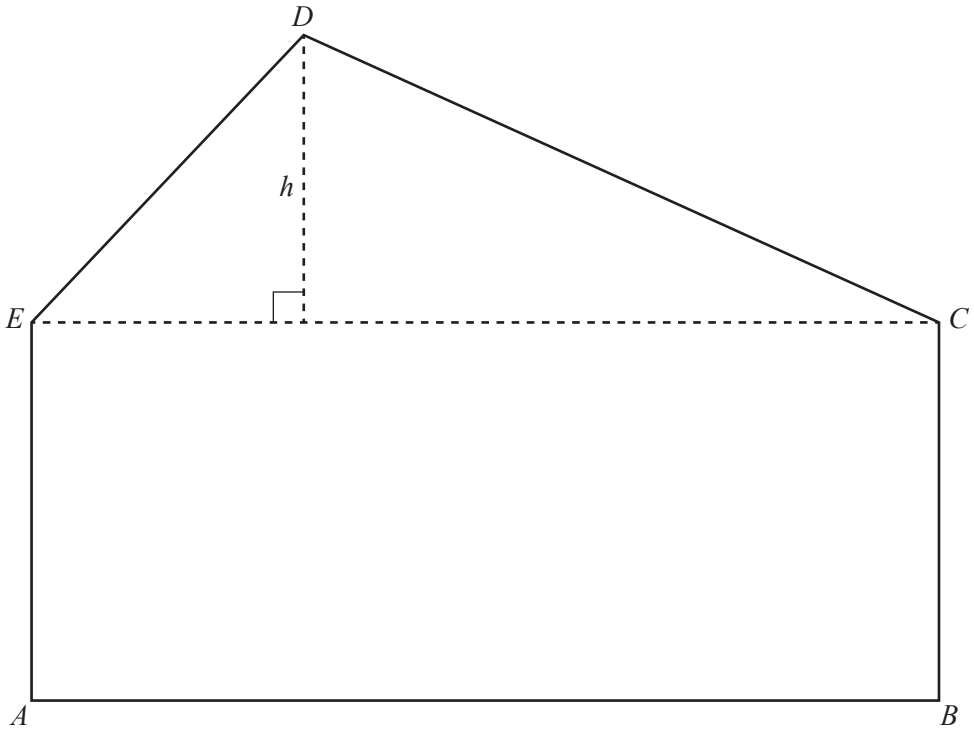
(e) **(i)** On the grid, draw a line from $(-1, 2)$ to $(1, 6)$. [1]

(ii) Find the equation of this line in the form $y = mx + c$.

View solution

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

5 The scale drawing shows a play area, *ABCDE*.
The scale is 1 centimetre represents 3 metres.



Scale: 1 cm to 3 m

(a) Find the actual distance h in metres.

View solution

$h =$ ..... m [2]

(b) Find the actual area of triangle *CDE*.

View solution

..... m^2 [3]

(c) A straight path crosses the play area from *C* to *AB*.
It is equidistant from *CB* and *CD*.

View solution

Using a straight edge and compasses only, construct the path.
Show all your construction arcs. [2]

(d) There is a circular pool in the play area.
The pool has a diameter of 8 m.

View solution

Calculate

(i) the circumference of the pool,

..... m [2]

(ii) the area of the pool.

View solution

..... m^2 [2]

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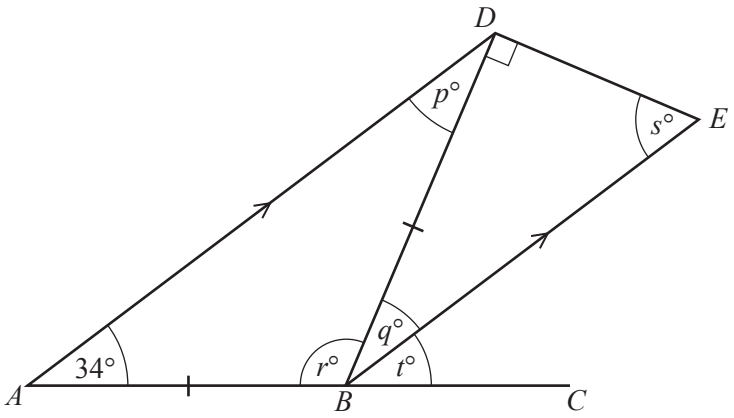
6 (a)

View solution



NOT TO SCALE

In the diagram, ABC is a straight line.
AD is parallel to BE, angle $BAD = 34°$ and $AB = BD$.

(i) Complete the statements.

(a) $p =$ ..... because ..... [2]

(b) $q =$ ..... because ..... [2]

(ii) Work out the value of r and the value of s.

View solution

$r =$ .....

$s =$ ..... [2]

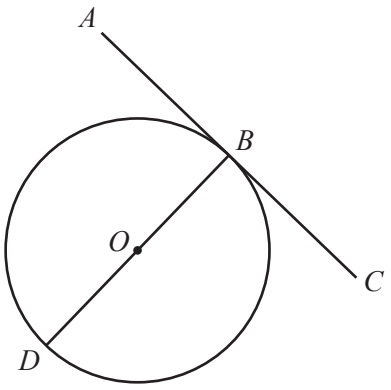
(iii) Find the value of t and give a reason for your answer.

View solution

$t =$ ..... because ..... [2]

(b)

View solution



NOT TO SCALE

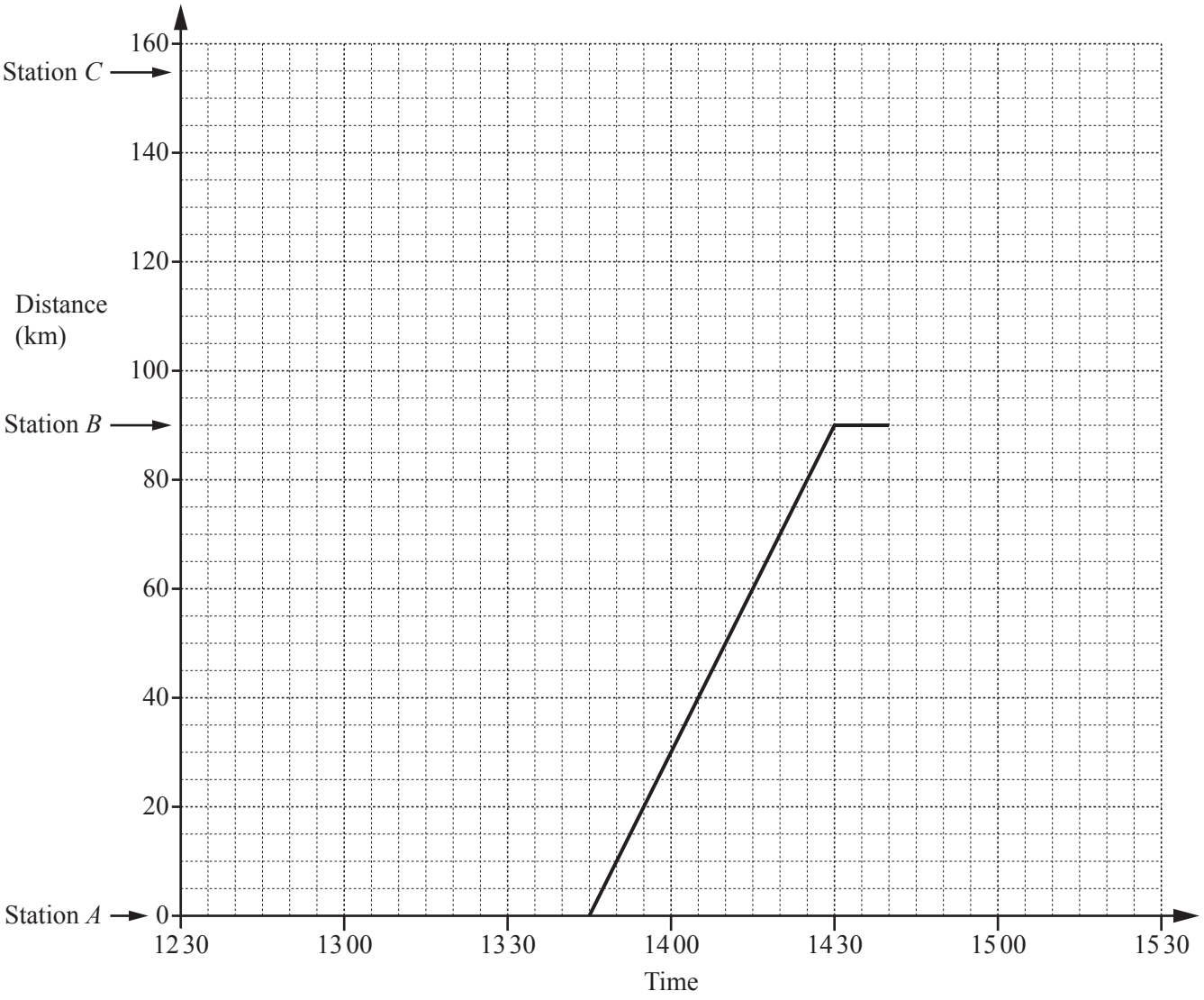
In the diagram, B and D are points on the circumference of a circle, centre O.
AC is a straight line touching the circle at B only and BD is a straight line through O.

Complete the statement.

Angle $ABD =$ ..... because .....

..... [2]

7 The travel graph shows part of a train journey between station *A* and station *C*.



(a) **(i)** Calculate, in km/h, the speed of the train between station *A* and station *B*.

View solution

.....km/h [2]

(ii) The train leaves station *B* at 14 40.

View solution

For how many minutes did the train stop at station *B*?

.....min [1]

(iii) The train travels at a constant speed between station *B* and station *C*, arriving at 15 20. View solution

Complete the travel graph for the journey between station *B* and station *C*. [1]

(iv) On which part of the journey was the train travelling faster? View solution

Between station ..... and station ..... [1]

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(b) Another train leaves station *C* at 12 45.
It travels to station *A* at a constant speed of 62 km/h without stopping at station *B*.

View solution

(i) Work out how long, in hours and minutes, this journey takes.

..... h ..... min [2]

(ii) Write down the time this train arrives at station *A*.

..... [1]

(iii) On the grid, show the journey of this train. [1]

(iv) Find the distance from station *A* when the two trains pass each other.

..... km [1]

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8 **(a)** Kyung records the number of people in each of 24 cars on Wednesday.
His results are shown below.

View solution

1	3	6	1	2	2	4	5
3	4	1	5	3	2	4	1
1	1	2	4	4	1	2	1

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

Number in a car	Tally	Frequency
1		
2		
3		
4		
5		
6		

[2]

(ii) Write down the mode.

View solution

..... [1]

(iii) Work out the range.

View solution

..... [1]

(iv) Work out the median.

View solution

..... [1]

(v) Calculate the mean.

View solution

..... [3]

(vi) One of these cars is chosen at random.

View solution

Find the probability that the number of people in this car is 4.

..... [1]

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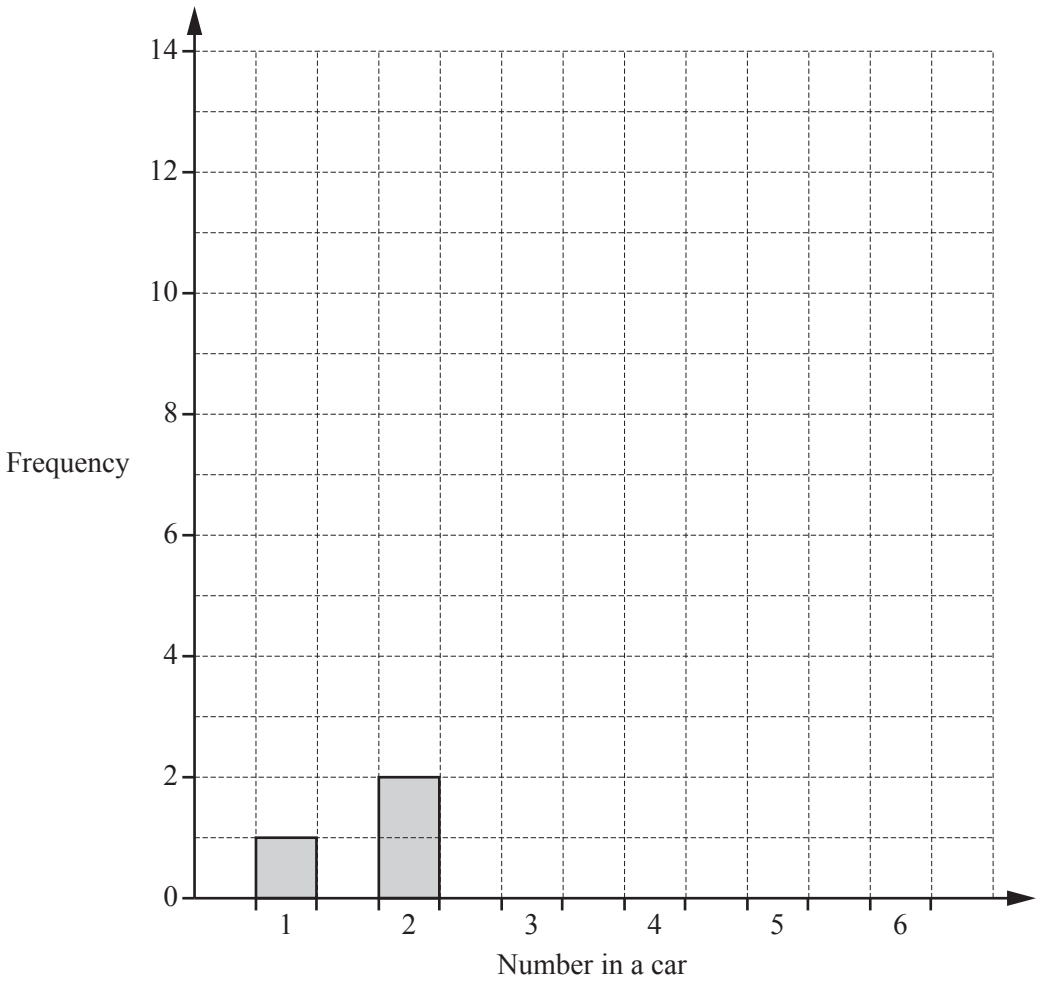
(b) Kyung also records the number of people in each of 24 cars on Saturday.
The table shows the results.

View solution

Number in a car	1	2	3	4	5	6
Frequency	1	2	5	13	2	1

On the grid, complete the bar chart to show these results.



[2]

(c) Write down one comparison between the frequency tables in **part (a)(i)** and **part (b)**.

View solution

.....

..... [1]

Question 9 is printed on the next page.

9 Mr Razif travels by bus from Singapore to Kuala Lumpur with his wife and his four children.

View solution

(a)

Ticket Price	
Adult	$32.40
Child	$24.40
Family (2 adults and 3 children)	$115.00

Work out how much Mr Razif saves if he buys a family ticket and one child ticket rather than six individual tickets.

$ ..... [4]

View solution

(b) The bus leaves Singapore at 1240 and arrives in Kuala Lumpur at 1735.

Work out, in hours and minutes, the time this journey takes.

..... h .....min [1]

View solution

(c) Mr Razif changes some dollars into Malaysian ringgits.
He receives 318 ringgits when the exchange rate is $1 = 4.24 ringgits.

Work out how many dollars he changes.

$ ..... [2]

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