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0580/33

May/June 2019

2 hours

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

READ THESE INSTRUCTIONS FIRST

DO **NOT** WRITE IN ANY BARCODES.

For π , use either your calculator value or 3.142.

The total of the marks for this paper is 104.

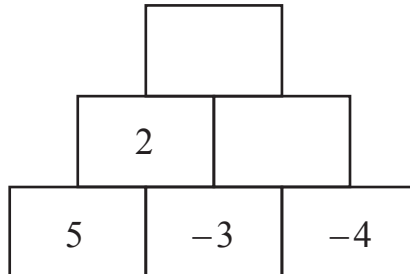
This document consists of **16** printed pages.

- 1 (a) Write this number in figures.

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

..... [1]

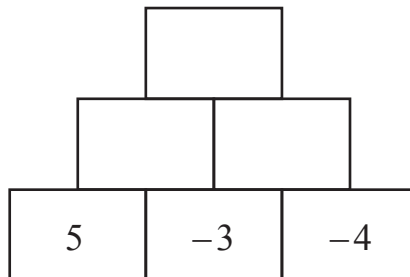
- (b) (i) Two numbers are **added** together to give the number in the box immediately above.



Complete the diagram.

[2]

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



Complete the diagram.

[3]

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

$$\frac{5}{27}$$

$$18.4\%$$

$$1.83 \times 10^{-1}$$

$$5^{-1}$$

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

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

..... % [1]

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

..... [2]

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

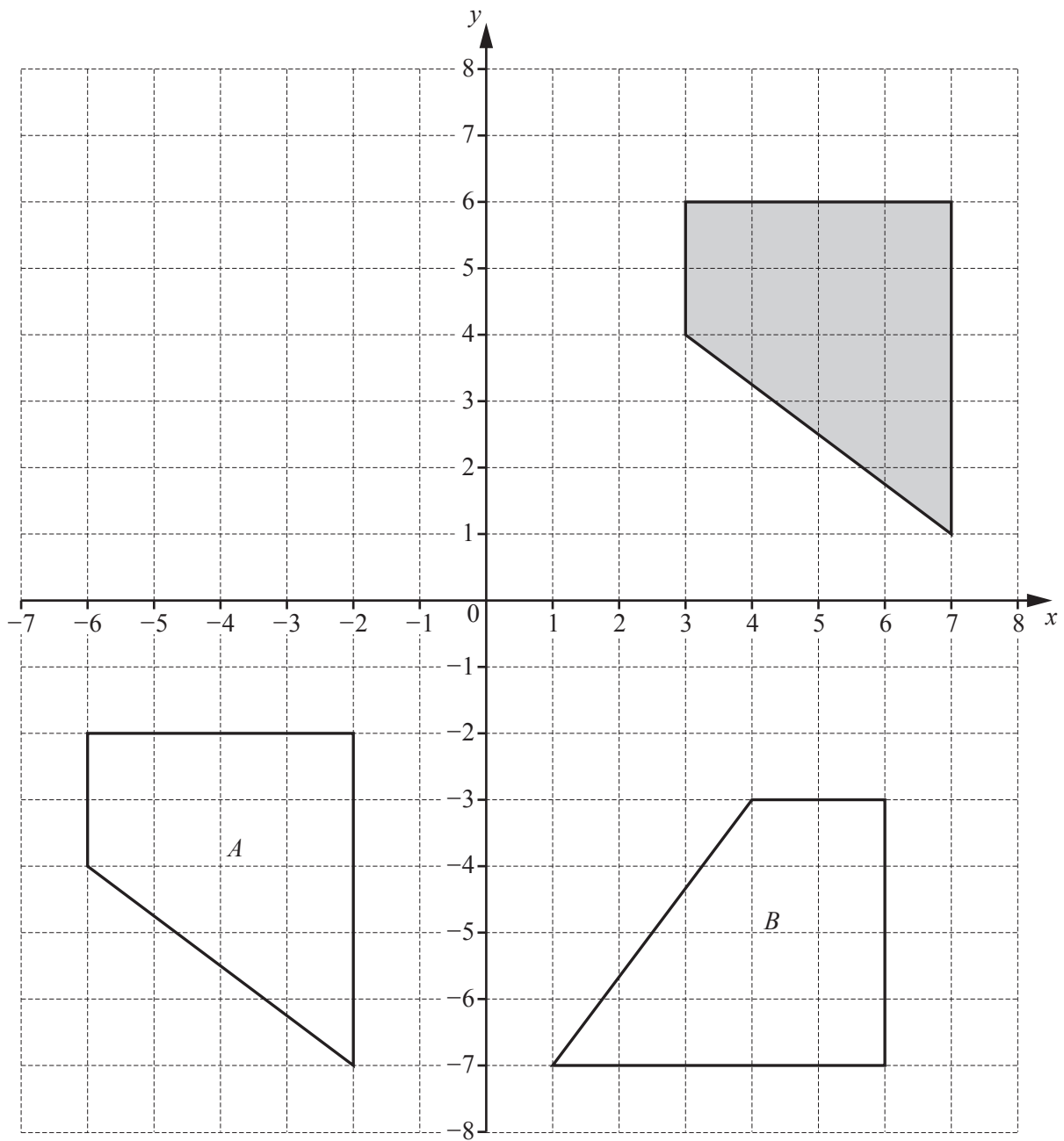
..... [2]

(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.

..... hours [2]

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



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

..... [1]

(b) For the shaded quadrilateral

(i) **measure** the perimeter,

..... cm [1]

(ii) work out the area.

..... cm² [1]

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

(i) quadrilateral *A*,

.....
 [2]

(ii) quadrilateral *B*.

.....
 [3]

(d) On the grid,

(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]

- 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.

..... : : [2]

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

$$\text{violins : cellos : double basses} = 9 : 2 : 1.$$

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

[1]

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

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.

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.

Find the number of horns.

..... [2]

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

	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.

\$ [1]

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

Find how much more money is needed.

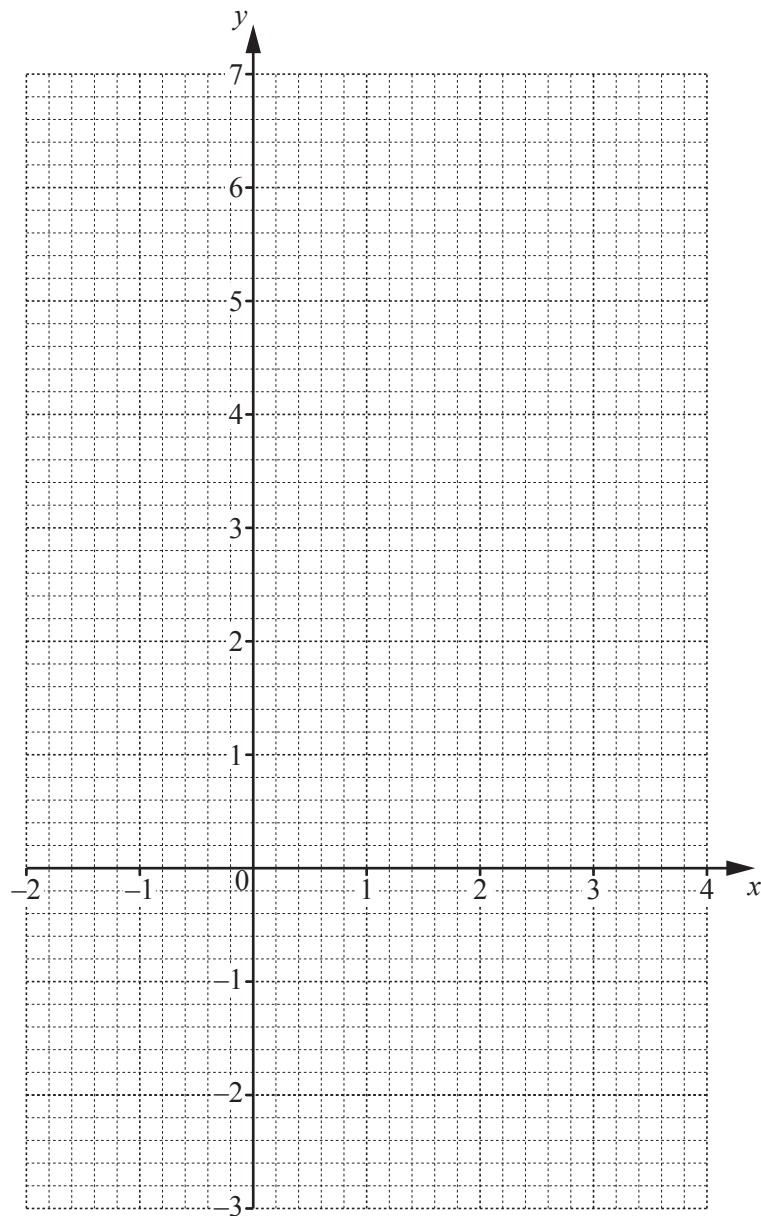
\$ [2]

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

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 $-2 \leq x \leq 4$.



[4]

- (c) (i) On the grid, draw the line of symmetry.

[1]

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

..... [1]

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

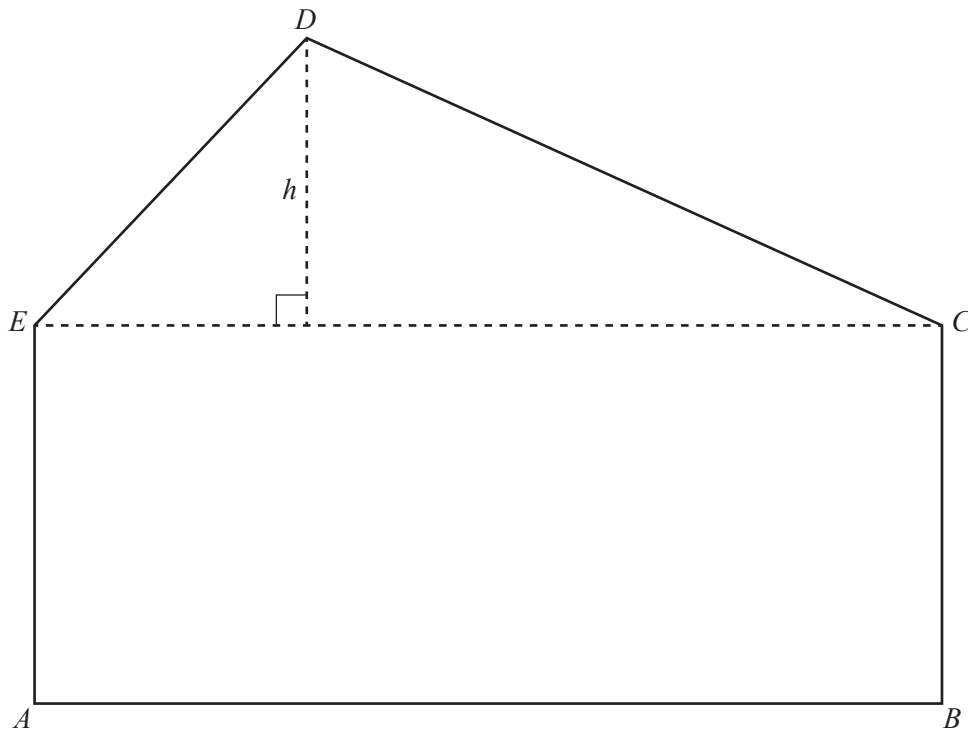
$x = \dots\dots\dots$ or $x = \dots\dots\dots$ [2]

(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 $y = mx + c$.

$y = \dots\dots\dots$ [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.

$h = \dots\dots\dots$ m [2]

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

$\dots\dots\dots$ m² [3]

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

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.

Calculate

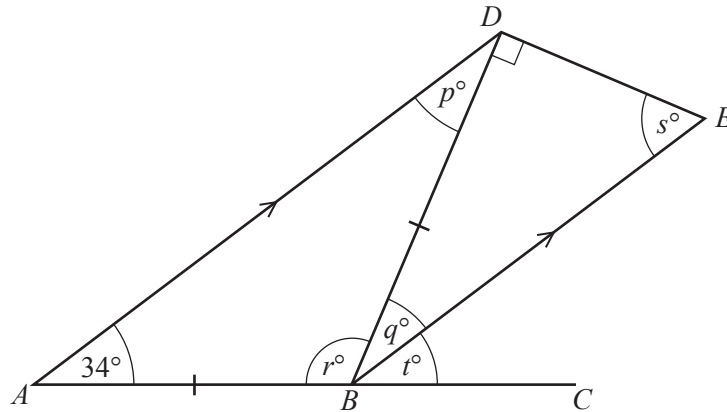
- (i) the circumference of the pool,

$\dots\dots\dots$ m [2]

- (ii) the area of the pool.

$\dots\dots\dots$ m² [2]

6 (a)

NOT TO
SCALE

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

(i) Complete the statements.

(a) $p = \dots\dots\dots$ because $\dots\dots\dots$ [2]

(b) $q = \dots\dots\dots$ because $\dots\dots\dots$ [2]

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

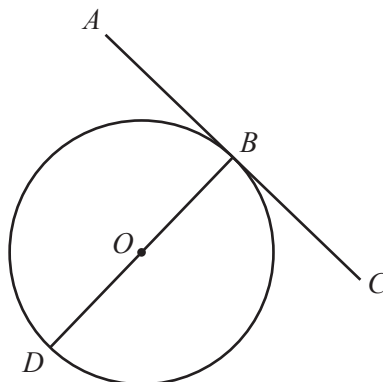
$r = \dots\dots\dots$

$s = \dots\dots\dots$ [2]

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

$t = \dots\dots\dots$ because $\dots\dots\dots$ [2]

(b)

NOT TO
SCALE

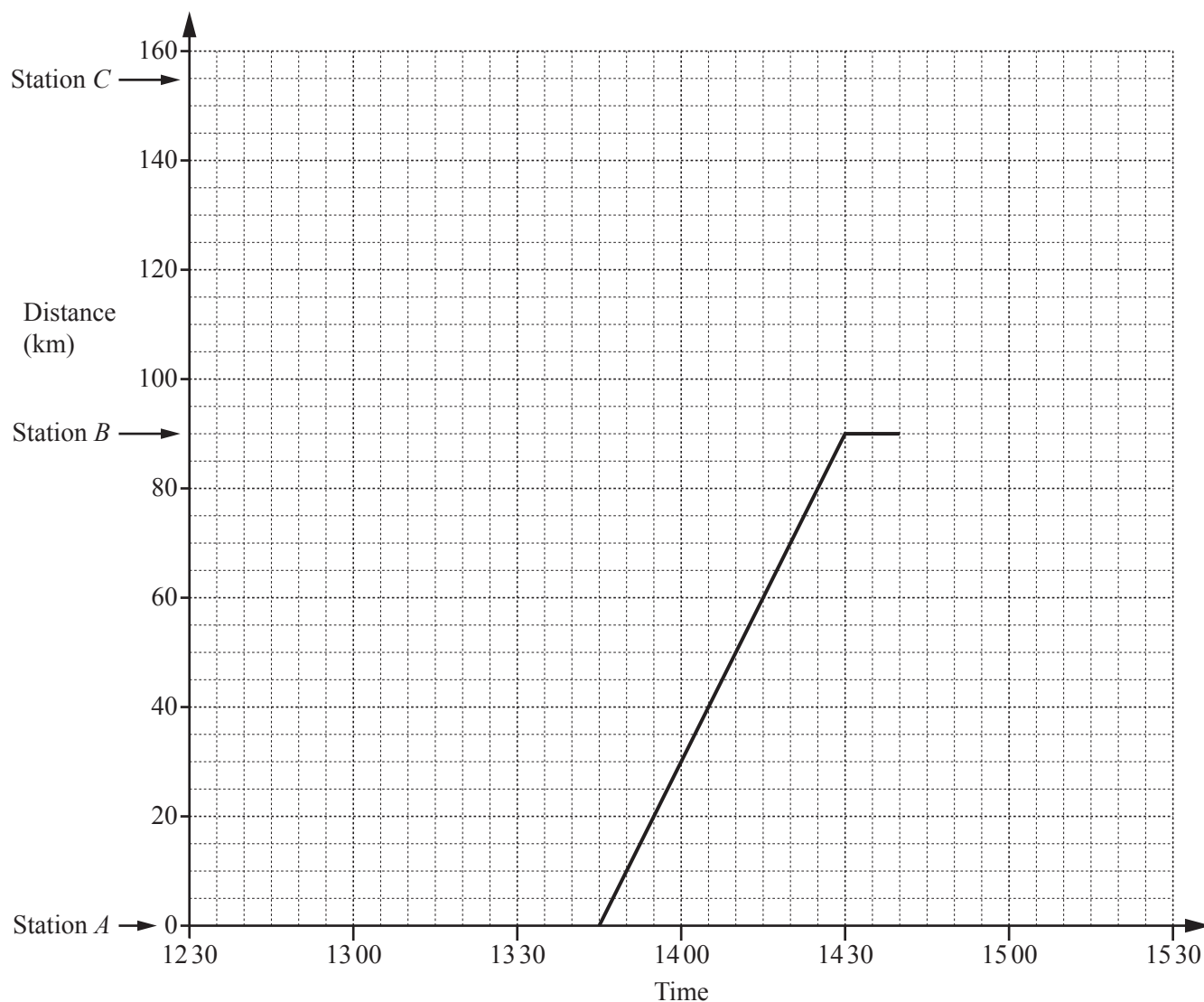
In the diagram, B and D are points on the circumference of a circle, centre O .
 AC is a straight line touching the circle at B only and BD is a straight line through O .

Complete the statement.

Angle $ABD = \dots\dots\dots$ because $\dots\dots\dots$

$\dots\dots\dots$ [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*.

..... km/h [2]

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

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.

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?

Between station and station [1]

- (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*.

(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]

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

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.

..... [1]

- (iii) Work out the range.

..... [1]

- (iv) Work out the median.

..... [1]

- (v) Calculate the mean.

..... [3]

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

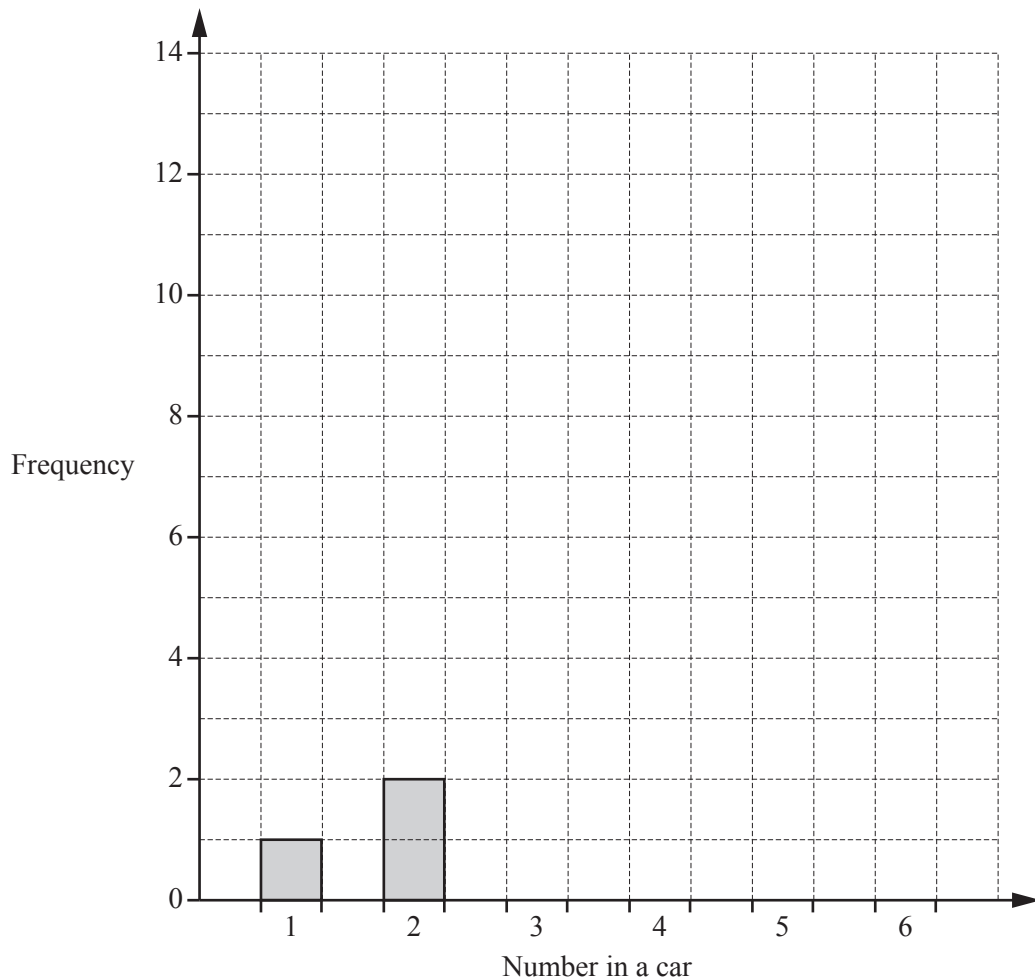
Find the probability that the number of people in this car is 4.

..... [1]

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

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)**.

.....

.....

[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.

(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]

- (b) The bus leaves Singapore at 12 40 and arrives in Kuala Lumpur at 17 35.

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

..... h min [1]

- (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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