Answer **all** questions in the spaces provided.

1 Use your calculator to evaluate

$$\frac{9.3 + 7.9}{4.6 - 2.7}$$

1 (a) Write down your full calculator display.

Answer ..... *(1 mark)*

1 (b) Write down your answer to a suitable degree of accuracy.

Answer ..... *(1 mark)*

2 Naismith's rule is used to calculate an approximate time for mountain walks.

> Allow 1 hour for every 5 km walked,
> plus
> 30 minutes for every 300 metres of ascent.

The walk from Dungeon Ghyll to the top of Scafell Pike in the Lake District is a distance of 18 km.
The total ascent is 1400 metres.

Lannie calculates an approximate time of 6 hours.
Show that Lannie is correct.

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(4 marks)

6

3 Share £47 between Adam and Beth so that Adam gets four times as much as Beth.

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Answer Adam £ .....

Beth £ ..... *(2 marks)*

4 The table shows the year group and gender of a sample of 50 pupils.

	Year Group					
Gender	**Yr7**	**Yr8**	**Yr9**	**Yr10**	**Yr11**	**Total**
Number of boys	3	5	6	2	6	22
Number of girls	4	5	7	6	6	28

4 (a) What percentage of the sample is in Year 11?

.....

Answer ..... % *(1 mark)*

4 (b) A pupil from the sample is picked at random.

What is the probability that the pupil is in Year 8?
Give your answer as a fraction in its lowest terms.

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Answer ..... *(2 marks)*

4 (c) There are 1500 pupils in the school altogether.

Use the table to estimate the number of boys in the school.

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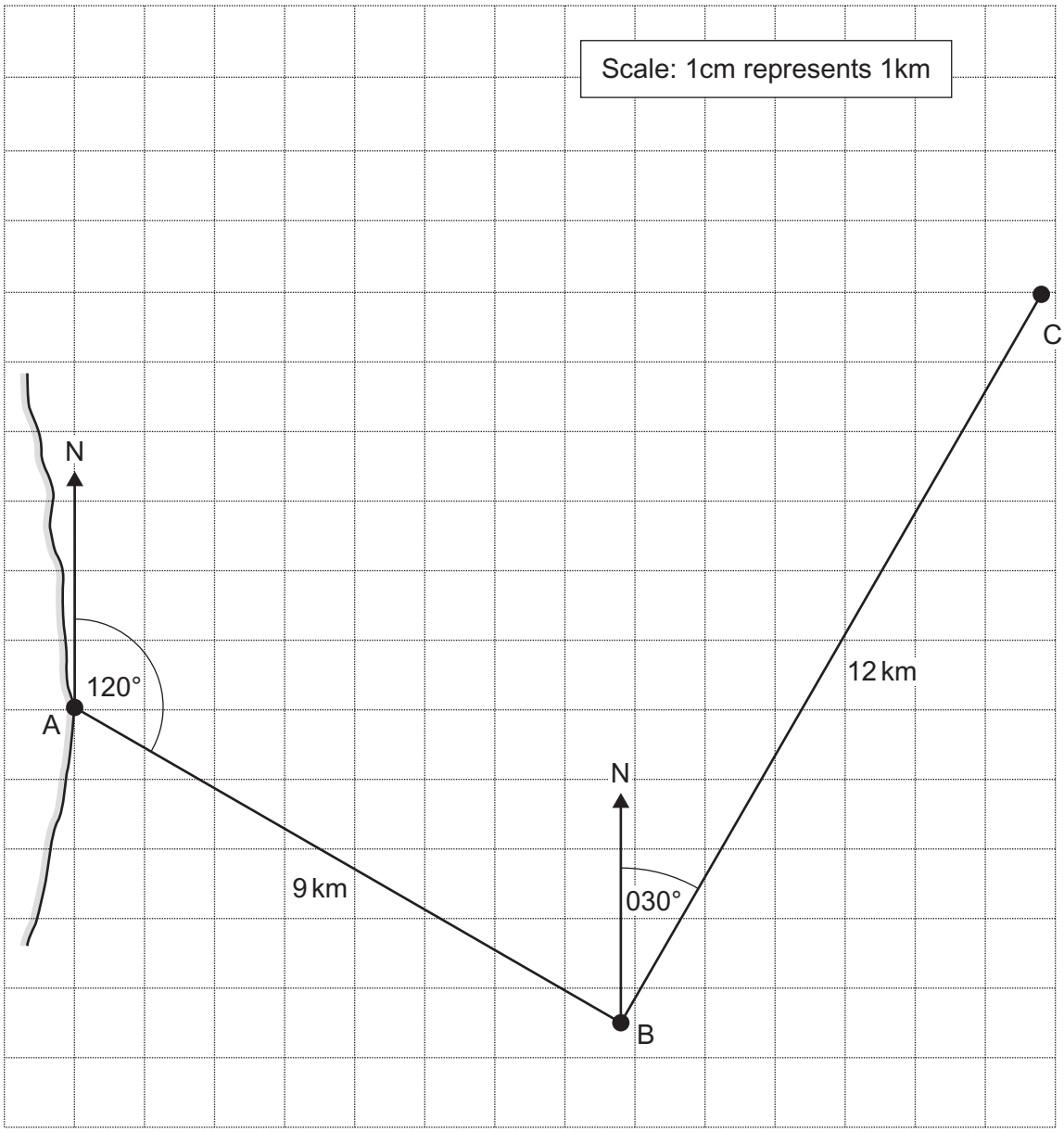
Answer ..... *(2 marks)*

5 A ship leaves port A and travels 9 km on a bearing of 120° to point B.
The ship then turns and travels 12 km on a bearing of 030° to point C.
This journey is shown on the scale drawing below.



The ship then turns and travels directly back from C to A.

Use a ruler and protractor to work out the distance and bearing of the journey from C to A

Distance ..... km

Bearing..... ° *(3 marks)*

10

6 (a) Expand $3(2w - 4)$

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Answer ..... *(1 mark)*

6 (b) Factorise $x^2 - 3x$

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Answer ..... *(1 mark)*

6 (c) Expand and simplify $3(y - 1) - 2(y + 4)$

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Answer ..... *(2 marks)*

6 (d) Solve the equation $3(4z + 1) = 21$

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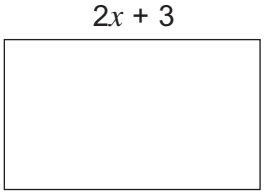
Answer $z =$ ..... *(3 marks)*

7 A rectangle has sides of $(2x + 3)$ cm and $(x - 2)$ cm.
The perimeter is 32 cm.



Not drawn accurately

Work out the value of x.

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Answer $x =$ ..... *(3 marks)*

8 (a) Complete the table to show some properties of quadrilaterals.
The first one has been done for you.

	Both pairs of opposite angles equal	Diagonals equal in length	Rotational symmetry of order 2
Parallelogram	✓	✗	✓
Square			
Rhombus			
Kite			

(3 marks)

8 (b) The four quadrilaterals in part (a) are

Parallelogram **Square** **Rhombus** **Kite**

Give a reason why the parallelogram is the odd one out.

The parallelogram is the odd one out because .....

.....

(1 mark)

9 In a sale the price of a bike is reduced by 15%.
The sale price is £178.50

What was the price of the bike before the reduction?

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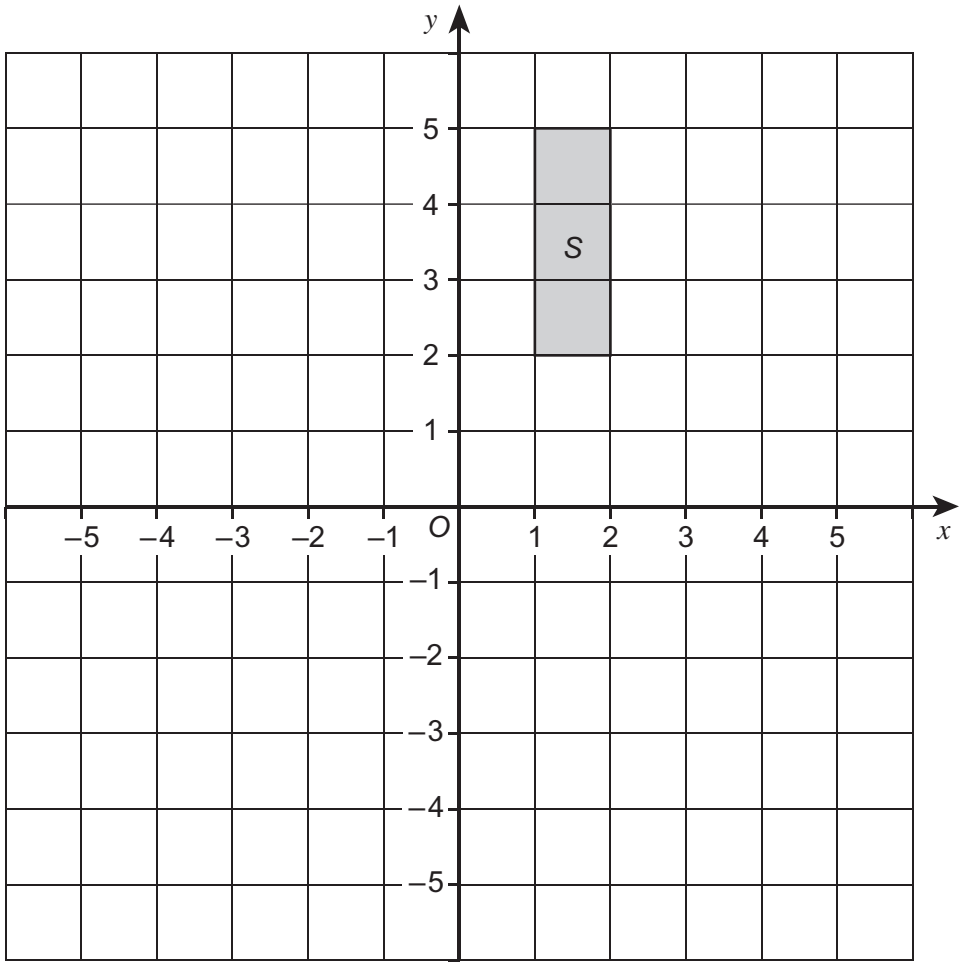
Answer £ ..... *(3 marks)*

17

10



10 (a) Reflect shape *S* in the line $y = x$
Label it *R*.

(2 marks)

10 (b) Translate shape *S* by the vector $\begin{pmatrix} -3 \\ -4 \end{pmatrix}$

Label it *T*.

(2 marks)

11 At a concert, the ratio of adults to children in the audience is 2 : 3
There are 786 children in the audience.
An adult ticket costs twice as much as a child ticket.
The total box office takings for the concert are £11 921

Work out the cost of an adult ticket.

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Answer £ ..... *(5 marks)*

Turn over for the next question

9

12 (a) Amy, Dev and Kaz are playing with a normal fair dice.
They each predict the next seven throws.

Amy	1	2	1	2	1	2	1
Dev	3	5	2	2	4	6	1
Kaz	4	4	4	4	4	4	4

Which, if any, of these predictions is the most likely?
Circle your choice and explain your answer.

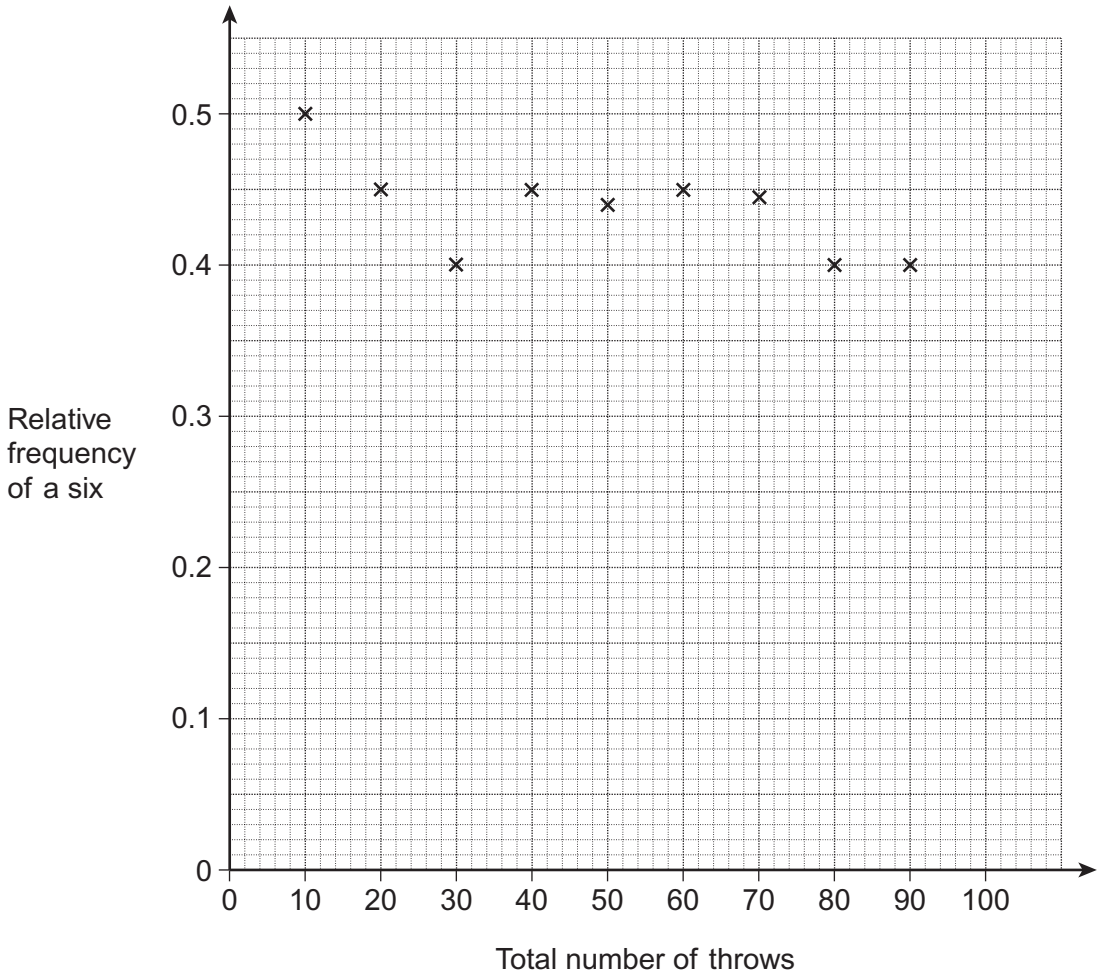
Amy Dev Kaz All are equally likely

Explanation .....

.....

(2 marks)

12 (b) Mia makes a six-sided dice.
To test the dice she throws it 100 times.
After each 10 throws she records the number of sixes thrown.
The relative frequencies for the first 90 throws are shown on the graph.



12 (b) (i) How many sixes were there in the first 10 throws?

Answer ..... *(1 mark)*

12 (b) (ii) After 100 throws there were 42 sixes.

Calculate and plot the relative frequency of a six after 100 throws.

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(1 mark)

12 (b) (iii) How many sixes would you expect to get after 100 throws of a **fair** dice?

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Answer ..... *(1 mark)*

12 (b) (iv) Is Mia's dice fair?
Tick the correct box.

☐ Yes ☐ No

Give a reason for your answer.

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(1 mark)

6