

Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

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Forename(s)

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Candidate signature

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# GCSE MATHEMATICS

# F

Foundation Tier      Paper 1 Non-Calculator

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Date of Exam

Morning

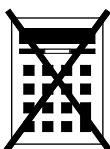
Time allowed: 1 hour 30 minutes

## Materials

**For this paper you must have:**

- mathematical instruments.

You must **not** use a calculator.



## Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

## Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.

## Advice

- In all calculations, show clearly how you work out your answer.

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

**1** What is  $\frac{9}{10}$  as a percentage?

Circle your answer.

[1 mark]

0.09%

0.9%

9%

90%

**2** Which one of these numbers is a multiple of 12?

Circle your answer.

[1 mark]

72

74

76

78

**3** What name is given to the **most frequent** item in a list?

Circle your answer.

[1 mark]

mean

median

mode

range

- 4** Convert 2.5 metres into centimetres.  
Circle your answer.

**[1 mark]**

0.025 cm

25 cm

205 cm

250 cm

- 5** Work out  $7152 + 876 - 139$

**[2 marks]**

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Answer \_\_\_\_\_

**Turn over for the next question**

**6** The first part of a show starts at 7.45 pm  
It lasts 35 minutes.

**6 (a)** What time does the first part end?

**[1 mark]**

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Answer \_\_\_\_\_

**6 (b)** After the first part there is a 20-minute break.  
The **second** part lasts 45 minutes.

What time does the second part end?

**[2 marks]**

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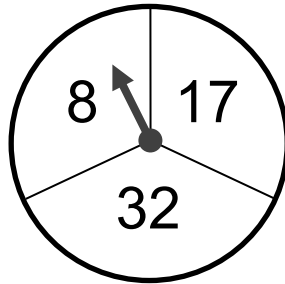
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Answer \_\_\_\_\_

- 7 A game is played with a fair spinner.



The player spins the spinner twice.  
The player adds the two numbers to get the score.

- 7 (a) Complete the table to show the possible scores.

[2 marks]

		First spin		
		8	17	32
Second spin	8			
	17			
	32			

- 7 (b) Work out the probability that the score is a **square** number.

[2 marks]

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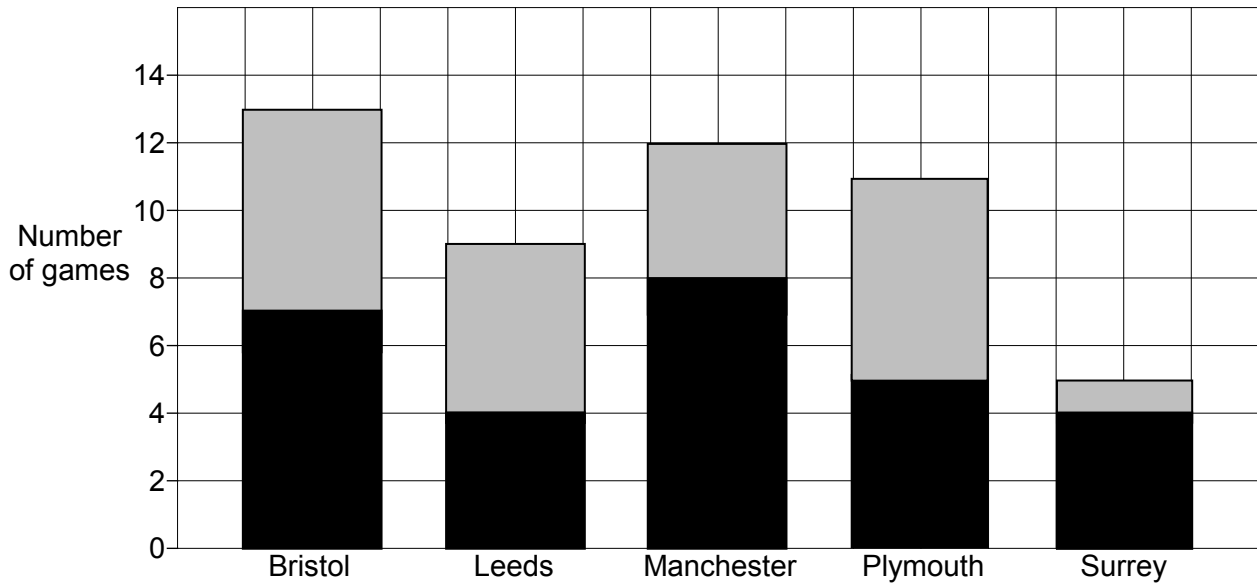
Answer \_\_\_\_\_

8 Here is information about five basketball teams.

Key

 Away wins

 Home wins



8 (a) Which team had the most **home** wins?

[1 mark]

Answer \_\_\_\_\_

8 (b) Which **two** teams had the same number of away wins?

[1 mark]

\_\_\_\_\_  
\_\_\_\_\_

Answer \_\_\_\_\_ and \_\_\_\_\_

**8 (c)** How many **more** home wins than away wins were there altogether?

**[3 marks]**

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Answer \_\_\_\_\_

**9 (a)** Solve  $x + 12 = 29$

**[1 mark]**

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$x =$  \_\_\_\_\_

**9 (b)** Solve  $0.5y = 20$

**[1 mark]**

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$y =$  \_\_\_\_\_

**10** Boxes cost £2.40 each.

You can use this table to work out the cost of different numbers of boxes.

<b>Number of boxes</b>	1	2	5	10
<b>Cost</b>	£2.40	£4.80	£12	£24

**10 (a)** Work out the cost of 3 boxes.

**[2 marks]**

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Answer £ \_\_\_\_\_

**10 (b)** Ethan pays £52.80 for some of these boxes.

Work out the number of boxes he buys.

**[2 marks]**

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Answer \_\_\_\_\_

**10 (c)** Use the table to write £9.60 : £12 as a ratio in its simplest form.

**[1 mark]**

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Answer \_\_\_\_\_ : \_\_\_\_\_



- 11** How many degrees does the **hour** hand on a clock turn in 9 hours?  
Circle your answer.

[1 mark]

45°

270°

540°

3240°

- 12** What fraction of  $1\frac{1}{4}$  is  $\frac{1}{8}$ ?  
Circle your answer.

[1 mark]

$\frac{1}{32}$

$\frac{1}{10}$

$\frac{1}{6}$

$\frac{1}{4}$

- 13** A point lies on the graph with equation  $y = x^2 + x$   
The  $x$ -coordinate of the point is  $-3$   
Circle the coordinates of the point.

[1 mark]

$(-3, -12)$

$(-3, -6)$

$(-3, 6)$

$(-3, 12)$

Turn over for the next question

Turn over ►

**14** Is  $30 \times 445$  greater than  $15 \times 900$ ?

Give a reason for your answer.

**[2 marks]**

Tick a box

Yes

No

Reason

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**15** Rearrange  $p = r + 3$  to make  $r$  the subject.

Circle your answer.

**[1 mark]**

$$r = p + 3$$

$$r = p - 3$$

$$r = 3 - p$$

$$r = \frac{p}{3}$$

**16 (a)** Work out  $\frac{1}{4} + \frac{7}{10}$

Give your answer as a fraction.

**[2 marks]**

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Answer \_\_\_\_\_

**16 (b)** Work out  $\frac{3}{5} \times \frac{7}{2}$

Give your answer as a mixed number.

**[2 marks]**

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Answer \_\_\_\_\_

**17** A shopkeeper uses this formula to work out the cost of bags of oranges.

$$C = 1.8n$$

$C$  is the cost in £

$n$  is the number of bags

**17 (a)** Work out the cost of 7 bags.

**[2 marks]**

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Answer £ \_\_\_\_\_

**17 (b)** There are four oranges in each bag.

Work out the average cost of an orange.

Give your answer in pence.

**[2 marks]**

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Answer \_\_\_\_\_ pence

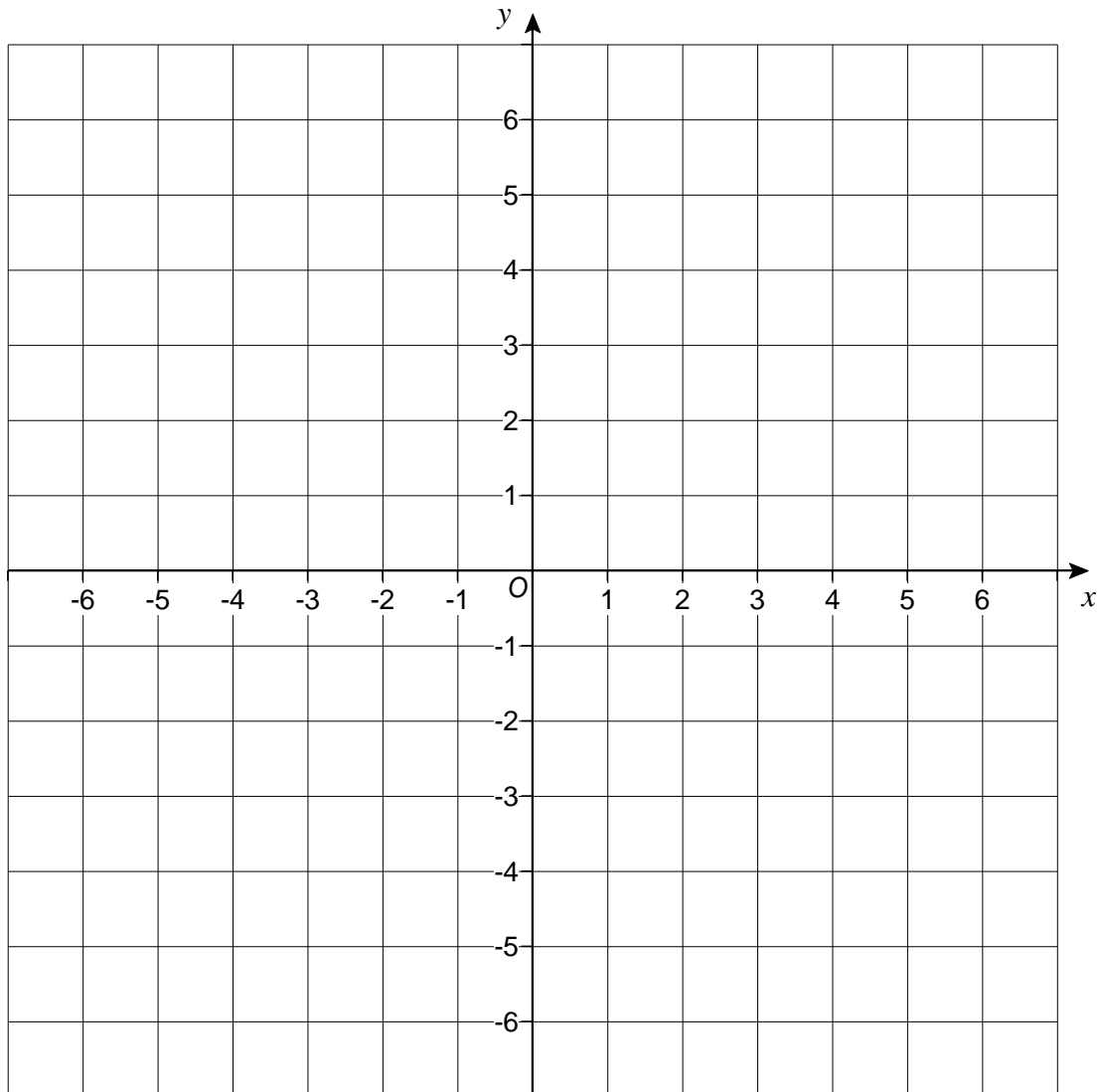
18

A straight line passes through the points  $(-1, 2)$  and  $(1, 6)$

Another straight line has equation  $y = x$

Work out the coordinates of the point of intersection of the two lines.

You may use the grid to help you.

**[4 marks]**

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Answer ( \_\_\_\_\_ , \_\_\_\_\_ )

**Turn over ►**

19

Ajit is a barber.

He charges £5 for a haircut.

He charges 10% extra for hair gel.

One day 52 customers have a haircut.

16 of these ask for hair gel.

Work out the **total** amount that Ajit charges his customers that day.

[5 marks]

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Answer £ \_\_\_\_\_

**20** By rounding each number to 1 significant figure, estimate the answer to

$$\frac{78 \times 11.6}{391}$$

You **must** show your working.

**[3 marks]**

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Answer \_\_\_\_\_

**21** Solve  $\frac{x}{3} - 9 = 12$

**[2 marks]**

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$x =$  \_\_\_\_\_

- 22** At a lucky dip stall, players pick a ball at random from a tub and then replace it.



The tub contains      250 red balls  
                                 230 yellow balls  
                                 120 green balls.

Emma has 15 picks.

- 22 (a)** What is the probability that Emma wins a prize with her first pick?

**[2 marks]**

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Answer \_\_\_\_\_

- 22 (b)** With her 15 picks, Emma wins 4 prizes.

Is this **more** than the expected number?

You **must** show your working.

**[2 marks]**

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Answer \_\_\_\_\_



**23** The air pressure in a tyre measures 7.2 bar.  
Air is leaking out at the rate of 0.2 bar per day.

**23 (a)** Assume that the air continues to leak at the same rate.  
After how many days will the pressure measure 4.8 bar?

**[2 marks]**

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Answer \_\_\_\_\_

**23 (b)** In fact, the rate that the air leaks out increases each day.  
How does this affect your answer to part (a)?

**[1 mark]**

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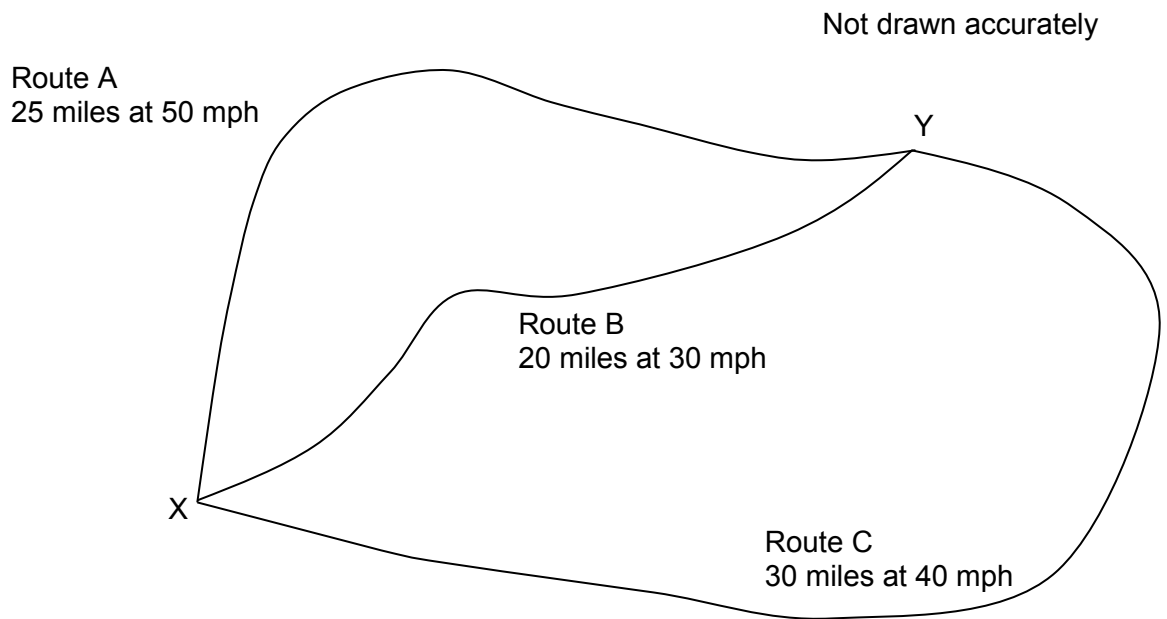
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**Turn over for the next question**

24

The diagram shows three routes, A, B and C, between two towns, X and Y.  
The distance and average speed for each route is shown.



24 (a) Which of the three routes takes the longest time?

Assume the average speeds given.

You **must** show your working.

[4 marks]

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Answer \_\_\_\_\_

**24 (b)** Jon and Matt take the same time to travel from X to Y.

Jon travels along route B at 10 mph **faster** than the average speed.

Matt travels along route C.

Does Matt travel faster or slower than the average speed for route C, and by how much?

You **must** show your working.

**[3 marks]**

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Tick a box.

Faster  Slower

Answer \_\_\_\_\_ mph

**25 (a)** Here are the fourth and fifth terms of a Fibonacci-type sequence.

\_\_\_\_\_ 28 43

Each term is the sum of the previous two terms.

Show that the first term is 2

**[2 marks]**

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**25 (b)** Here are the first and third terms of a different Fibonacci-type sequence.

$a$  \_\_\_\_\_  $b$  \_\_\_\_\_

Each term is the sum of the previous two terms.

Work out an expression in terms of  $a$  and  $b$  for the fifth term.

**[3 marks]**

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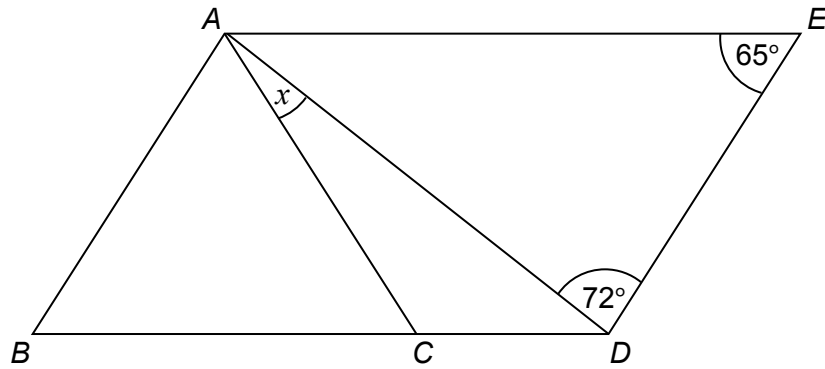
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Answer \_\_\_\_\_

26

 $ABDE$  is a parallelogram. $AB = AC$ Not drawn  
accuratelyShow that  $x = 22^\circ$ **[3 marks]**

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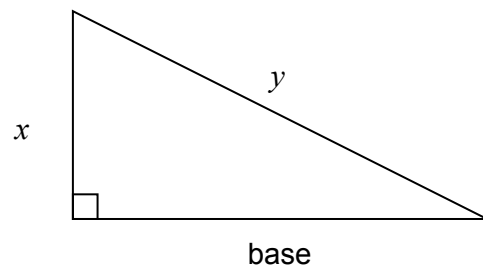
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Turn over ►

27

Noah is attempting to work out the base of **different** right-angled triangles.



Not drawn  
accurately

Here is his method with the working for  $y = 10$  and  $x = 6$

Work out the value of  $y^2$   $10^2 = 100$

Work out the value of  $x^2$   $6^2 = 36$

Work out the value of  $y^2 - x^2$   $100 - 36 = 64$

The base is  $\sqrt{y^2 - x^2}$  base =  $\sqrt{64}$

Tick the correct statement.

[3 marks]

The method will **always** give an answer which is a whole number.

The method will **sometimes** give an answer which is a whole number.

The method will **never** give an answer which is a whole number.

Show working to support your answer.

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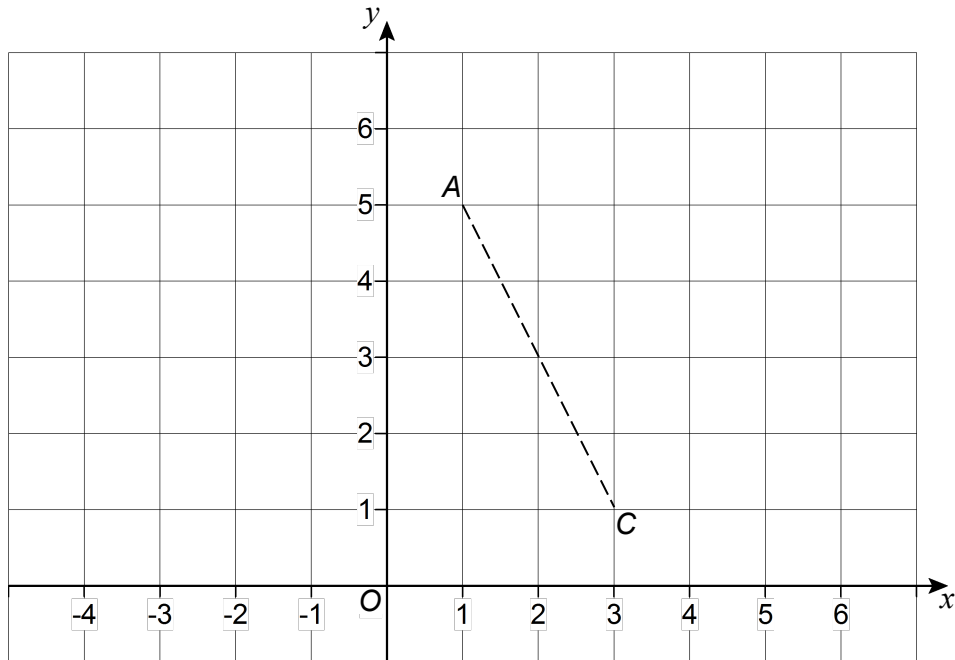
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28

$AC$  is a diagonal of kite  $ABCD$ .

$A$  is the point  $(1, 5)$

$C$  is the point  $(3, 1)$



The diagonals of the kite intersect at  $M$ , the midpoint of  $AC$ .

$$AM = BM$$

$$BM : MD = 1 : 2$$

Work out possible coordinates for  $B$  and  $D$ .

[2 marks]

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$B$  ( \_\_\_\_\_ , \_\_\_\_\_ ) and  $D$  ( \_\_\_\_\_ , \_\_\_\_\_ )

**END OF QUESTIONS**

**There are no questions printed on this page**

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