

MATHEMATICS –
COMPONENT 1
NON – CALCULATOR
MATHEMATICS
FOUNDATION TIER

THURSDAY,
25 MAY 2017 – MORNING

2 hours 15 minutes
(plus your additional
time allowance)

THE USE OF A
CALCULATOR IS NOT
PERMITTED IN THIS
EXAMINATION

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	3	
2.	4	
3.	7	
4.	2	
5.	3	
6.	5	
7.	4	
8.	8	
9.	4	
10.	5	
11.	4	
12.	6	
13.	4	
14.	3	
15.	2	
16.	5	
17.	4	
18.	4	
19.	3	
20.	7	
21.	8	
22.	4	
23.	4	
24.	5	
25.	4	
26.	5	
27.	3	
Total	120	

Surname:	
Other Names:	
Centre Number:	
Candidate Number:	0

ADDITIONAL MATERIALS

A ruler, a protractor and a pair of compasses may be required.

ITEMS INCLUDED WITH QUESTION PAPER

A separate Formula List.

A separate Diagram Booklet.

A spare Diagram Booklet.

INSTRUCTIONS TO CANDIDATES

Use black ink, black ball – point pen, black felt tip or your usual method.

Write your name, centre number and candidate number in the spaces on the front cover.

Answer ALL questions.

Write your answers in the spaces provided.

If you run out of space, use the continuation pages at the back of the booklet, taking care to number the question(s) correctly.

Take π as 3.14

(Turn over)

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part – question.

You are reminded of the need for good English and orderly, clear presentation in your answers.

1. Look at the table for Question 1 in the separate Diagram Booklet.

The table shows some words that may describe the numbers **1, 2, 8 or 9**

Complete the table by putting ticks (✓) in the correct boxes.

The first column has been done for you.

[3 marks]

2. (a) Write this statement in words.

$$67.31 < 700$$

[2 marks]

- (b) Work out the difference between the value of the digit 8 and the value of the digit 5 in the following number.

38 502

[2 marks]

(Turn over)

- 3. Look at the diagram for Question 3 in the separate Diagram Booklet.**

The diagram is a pictogram.

Alys asks a group of students:

“What is your favourite type of music?”

The pictogram shows her results.

- (a) Twenty students chose POP.**

On the diagram, complete the key for the pictogram.

[1 mark]

- (b) Write down the modal type of music.**

[1 mark]

- (c) How many students answered Alys’s question?**

[1 mark]

(Turn over)

Question 3 continued

- 3. (d) How many more students chose ROCK than chose OTHER MUSIC?**

[1 mark]

- (e) On the grid provided for Question 3 (e) in the separate Diagram Booklet, draw a bar chart of Alys's results.**

[3 marks]

(Turn over)

4. (a) Look at the diagram for Question 4 (a) in the separate Diagram Booklet.

Draw two more lines on the diagram, so that the shape has exactly three lines of symmetry.

[1 mark]

- (b) Look at the diagram for Question 4 (b) in the separate Diagram Booklet.

Renata says:

“The shape has rotational symmetry of order 4”

Explain why Renata is not correct.

[1 mark]

(Turn over)

5. (a) Look at the diagram for Question 5 (a) in the separate Diagram Booklet.

The diagram is NOT drawn to scale.

Find the size of angle X .

$X =$ _____ °

[1 mark]

- (b) Look at the diagram for Question 5 (b) in the separate Diagram Booklet.

The diagram is NOT drawn to scale.

Find the size of angle y .

$y =$ _____ °

[2 marks]

(Turn over)

6. (a) Write **5.907** correct to **1** decimal place.

[1 mark]

(b) Write **370** correct to **1** significant figure.

[1 mark]

continued on the next page . . .

(Turn over)

Question 6 continued

6. (c) The mass of one red apple is **132** grams.

ESTIMATE the mass of **38** of these
red apples.

Give your answer in KILOGRAMS.

kg

[3 marks]

(Turn over)

7. Daniel is a fast – food server.

**(a) One day, he works for 5 hours and
earns a total of £30.50**

**Work out how much Daniel is paid
for each hour.**

[2 marks]

continued on the next page . . .

(Turn over)

Question 7 continued

7. (b) In July, Daniel works for a total of 50 hours.

How much does Daniel earn in July?

You must show all your working.

[2 marks]

(Turn over)

8. A vending machine sells drinks.

Each drink costs **50** pence.

A sign on the machine shows the coins that can be used to buy the drinks.

Drinks: 50p This machine accepts 50p, 20p, 10p and 5p coins only NO CHANGE IS GIVEN

(a) Look at the table for Question 8 (a) in the separate Diagram Booklet.

Complete the table to show the **13** different ways of paying the **EXACT** amount for a drink.

[2 marks]

continued on the next page . . .

(Turn over)

Question 8 continued

8. (b) The machine has a display that shows how much cash has been put in.

The machine resets the display to **£0.00** after each drink is taken.

The cash container in the vending machine is emptied every night.

When it was emptied, the cash container contained the following coins:

50p	20p	10p	5p
10 coins	15 coins	31 coins	20 coins

- (i) Work out the greatest possible number of drinks that could have been sold.

You must state any assumption that you make.

(Turn over)

Assumption made _____

[5 marks]
(Turn over)

Question 8 (b) continued

- 8. (b) (ii) Comment on the effect that your assumption has had on your solution.**

[1 mark]

9. (a) Complete the table below.

	Calculation	Answer
A	4×9	
B	$\frac{3}{4}$ of 8	
C	-2×-12	
D	$2^3 + 1^2$	

[3 marks]

(b) Write down a relationship between the answers to calculation **A** and calculation **B**.

[1 mark]

(Turn over)

10. (a) Look at the diagram for Question 10 (a) in the separate Diagram Booklet.

The diagram shows a number machine.

- (i) The INPUT is 2

What is the OUTPUT?

[1 mark]

- (ii) The INPUT is $6\frac{1}{2}$

What is the OUTPUT?

[1 mark]

continued on the next page . . .

(Turn over)

Question 10 (a) continued

10. (a) (iii) The OUTPUT is 45

What is the INPUT?

[1 mark]

continued on the next page . . .

(Turn over)

Question 10 continued

- 10. (b) Look at the diagram for Question 10 (b) in the separate Diagram Booklet.**
The diagram shows a different number machine.

- (i) The INPUT, n , is always a whole number for this number machine.**

Which ONE of these statements describes the OUTPUT?

Circle your answer.

It must be odd
It must be even
It is sometimes odd and sometimes even

Show how you decided.

(Turn over)

[1 mark]

10. (b) (ii) Write an expression for the OUTPUT.
Give your answer in terms of n .

[1 mark]

(Turn over)

- 11. Look at the diagram for Question 11 in the separate Diagram Booklet.**

The diagram is a grid.

The grid shows a scale drawing of the flight path of a plane from Aston to Broad.

- (a) Write down the coordinates of Aston.**

[1 mark]

- (b) The scale of the drawing is
1 cm represents 50 km.
On average, the plane flies
4 km for each litre of fuel used.

Work out how much fuel is used
to fly from Aston to Broad.**

(Turn over)

Fuel used is _____ litres.

[3 marks]

12. Sam thinks of a number. His number is n .

Anwen, Bea and Carl also think of numbers.
Their numbers are shown in the table below.

Sam	n
Anwen	$n - 7$
Bea	$4n$
Carl	$\frac{n}{2}$

- (a) Anwen's number is seven less than Sam's number.

Using words, complete the following statement.

Bea's number is _____
_____ Sam's number.

[1 mark]

(Turn over)

Question 12 continued

12. (b) Carl says:

‘My number is double Sam’s number.’

Explain why Carl is not correct.

[1 mark]

(c) David thinks of a number.

His number is **9** more than

Anwen’s number.

Write an expression, in terms of **n** ,

for David’s number.

Give your answer in its simplest form.

[1 mark]

(Turn over)

Question 12 continued

12. (d) Anwen's number is 63

Find Carl's number.

[3 marks]

(Turn over)

13. (a) The area of a rectangle is 100 cm^2

**The length of the rectangle is 4 times
its width.**

Work out the width of this rectangle.

[2 marks]

continued on the next page . . .

(Turn over)

Question 13 continued

13. (b) A square has sides of length X cm.

**The length of a rectangle is equal
to the perimeter of this square.**

The perimeter of this rectangle is $14x$ cm.

**Find an expression for the width
of this rectangle.**

Give your answer in terms of X .

[2 marks]

(Turn over)

- 14. Look at the diagram for Question 14 in the separate Diagram Booklet.**

Jodie makes 4 patterns using these straight sticks 

Jodie has 90 sticks left after making patterns 1, 2, 3 and 4

She continues this sequence of patterns, starting with pattern 5

**How many MORE complete patterns can Jodie make before she runs out of sticks?
You MUST show all your working.**

(Turn over)

[3 marks]

(Turn over)

15. (a) Pavel has to work out $\sqrt{484}$
Here is his working.

$$\sqrt{484} = 484 \div 2 = 242$$

Pavel's method is incorrect.
Explain why.

[1 mark]

continued on the next page . . .

(Turn over)

Question 15 continued

15. (b) Nina works out $0.54 + 0.23 + 2$

Here is her working.

$$\begin{array}{r} 0.54 + 0.23 + 2 = \\ \begin{array}{r} 0.54 \\ 0.23 \\ 2 + \\ \hline 0.79 \end{array} \end{array}$$

Nina's friend says that this answer is too small.

Explain why Nina's friend is correct.

[1 mark]

(Turn over)

16. Ahmed, Blake and Cath are given cash tips when working in a cafe.

They share the tips in the ratio of the hours they work each week.

(a) One week, Ahmed works for 5 hours, Blake works for 6 hours and Cath works for 12 hours.

Cath's share of the tips for this week is £18

Work out Ahmed's share of the tips.

[2 marks]
(Turn over)

Question 16 continued

16. (b) The following week, the tips total £72

**Blake works twice as many hours
as Ahmed.**

**Cath works three times as many hours
as Ahmed.**

How much is Blake's share of the tips?

[3 marks]

(Turn over)

17. Dev buys and downloads music.

The number of tracks he buys in one month and the APPROXIMATE prices paid are shown in the table below.

PRICE PER TRACK (PENCE)	FREQUENCY
70	5
80	1
90	2
100	2

- (a) Using the values in the table, calculate an estimate of the mean price paid per track.

(Turn over)

[3 marks]

17. (b) All of the actual prices paid were
ROUNDED UP to give the values
in the table.

Is the mean price per track higher or lower
than your estimate in part (a)?

Give a reason for your answer.

[1 mark]

(Turn over)

18. Look at the diagram for Question 18 in the separate Diagram Booklet.

The diagram is NOT drawn to scale.

The diagram shows a rectangular garden, *ABCD*.

The garden is to be enclosed by a wire fence.

There must be a gap of 2 m for the gate.

Wire fencing costs

- **£32 for a whole 10 m roll**
- **£4.50 per metre**

Work out the cheapest cost of enclosing the garden with this wire fencing.

Justify your answer.

(Turn over)

[4 marks]

(Turn over)

19. Amy needs 14 identical pieces of ribbon to gift wrap some presents.

Amy has two rolls of ribbon that are the same length.

She cuts 10 pieces from the first roll of ribbon and has none left over.

She cuts the remaining pieces from the second roll of ribbon and has 9 metres left over.

If each piece of ribbon is r metres long, work out the value of r .

[3 marks]

(Turn over)

20. The table below gives some information about the nutritional value of **1000** grams of a breakfast cereal.

	Every 1000 g contains:
Fat	65 g
of which saturated fat	40 g
PROTEIN	80 g
Salt	2 g

(a) Show that

saturated fat : other fat = 8 : 5

[2 marks]

continued on the next page . . .

(Turn over)

Question 20 continued

20. (b) How much salt is there in a 50 gram serving of this cereal?

[3 marks]

continued on the next page . . .

(Turn over)

Question 20 continued

- 20. (c) It is recommended that an adult eats no more than 6 grams of salt per day.**

Meena is an adult and eats a 50 gram portion of the cereal.

What fraction of her daily salt intake does Meena eat?

Give your answer as a fraction in its simplest form.

[2 marks]
(Turn over)

21. (a) Solve $7x + 2 = 3x + 4$

[2 marks]

continued on the next page . . .

(Turn over)

Question 21 continued

21. (b) Solve $3 - 2(x - 9) = 5x$

[3 marks]

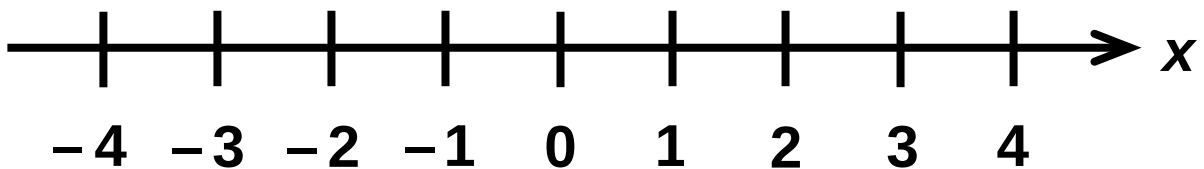
continued on the next page . . .

(Turn over)

Question 21 continued**21. (c) (i) Solve $7 - 3x < 1$**

[2 marks]

(ii) Represent your answer to part (c) (i) on the number line below.

**[1 mark]****(Turn over)**

- 22. Look at the information for Question 22 in the separate Diagram Booklet.**

Sasha is carrying out a survey into the amount of chocolate teenagers eat in a day.

- (a) The information shows a question from her survey:**

- (i) Explain why this is a biased question.**

[1 mark]

- (ii) State ONE other criticism of the question.**

(Turn over)

[1 mark]

22. (b) Sasha stands outside a supermarket on a Monday morning and surveys 10 people as they go in.

Are her results likely to be reliable?

Yes

☐

No

☐

Give TWO reasons to support your answer.

Reason 1: _____

Reason 2: _____

[2 marks]

(Turn over)

23. Look at the diagram for Question 23 in the separate Diagram Booklet.

The diagram shows a scale drawing of a lake. There are two small islands in the lake at *A* and *B*.

The lifeguard station is marked at *C*.

Swimming is only allowed in the area of the lake that is,

- nearer to *A* than it is to *B* and**
- less than **120** metres from *C*.**

Using a ruler and a pair of compasses, show accurately on the diagram the area where swimming is allowed.

Shade the area where swimming is allowed.

Use the scale **1 cm represents **10 m**.**

[4 marks]

(Turn over)

24. $\mathbf{p} = \begin{pmatrix} 6 \\ -1 \end{pmatrix}$ and $\mathbf{q} = \begin{pmatrix} -4 \\ 7 \end{pmatrix}$

(a) Work out the column vector $\mathbf{p} + 3\mathbf{q}$

[2 marks]

(b) When $\mathbf{p} + m\mathbf{q} = \begin{pmatrix} 10 \\ n \end{pmatrix}$

find the value of m and the value of n .

(Turn over)

$m =$ _____

$n =$ _____

[3 marks]

(Turn over)

- 25. Look at the table for Question 25 in the separate Diagram Booklet.**

The table shows the cost of sending items using a delivery service.

Riley is planning to send TWO laptops to James using this delivery service.

The laptops are to be sent with full insurance against being lost.

Each laptop is worth £700 and has a mass of 1250 g, CORRECT TO THE NEAREST 50 g.

Riley says,

The delivery charge is MORE than £20

James says,

You can send these for LESS than £20

Explain how Riley and James could have come to their conclusions.

Show all your working and state any assumption that you make.

(Turn over)

(Turn over)

- 26. Look at the diagram for Question 26 in the separate Diagram Booklet. The diagram is a Venn diagram.**

Twenty people go on a trip to the seaside.

Of these 20 people

- **13 swim in the sea**
- **17 go to the funfair**
- **2 do not swim in the sea or go to the funfair.**

- (a) Complete the Venn diagram to show this information.**

[2 marks]

(Turn over)

Question 26 continued

26. One person is chosen at random.

- (b) Find the probability that this person swims in the sea and goes to the funfair.**

[1 mark]

- (c) Find the probability that this person either swims in the sea or goes to the funfair, but does not do both.**

(Turn over)

[2 marks]

(Turn over)

27. Look at the diagram for Question 27 in the separate Diagram Booklet.

**In the diagram, $ABCDEF$ is a regular hexagon.
Explain why triangle BDF is equilateral.**

[illegible]

[3 marks]

END OF PAPER
TOTAL 120 MARKS

(Turn over)

Question number	Additional Pages, if required. Write the question number in the left - hand margin.

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GCSE – NEW

C300U10-1



MATHEMATICS – COMPONENT 1

NON – CALCULATOR MATHEMATICS

FOUNDATION TIER

THURSDAY, 25 MAY 2017 – MORNING

Diagram Booklet

Surname:	
Other Names:	
Centre Number:	
Candidate Number:	0

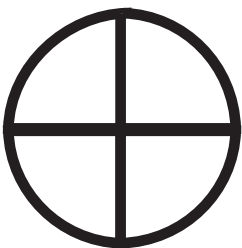
Question 1

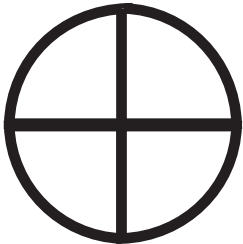
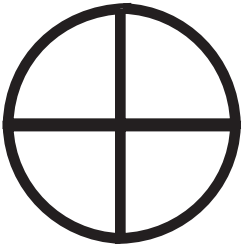
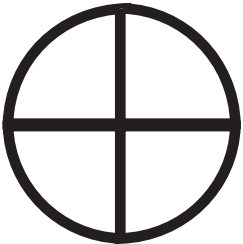
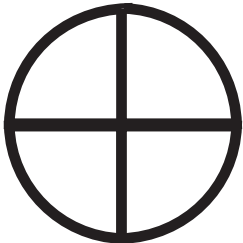
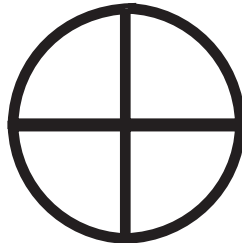
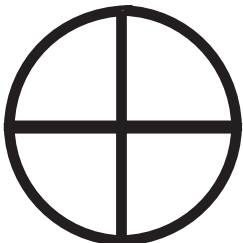
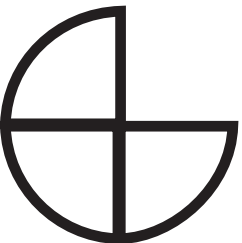
Table

	NUMBER			
WORDS	1	2	8	9
Prime				
Odd	✓			
Even				
Square	✓			
Cube	✓			

Question 3

“What is your favourite type of music?”

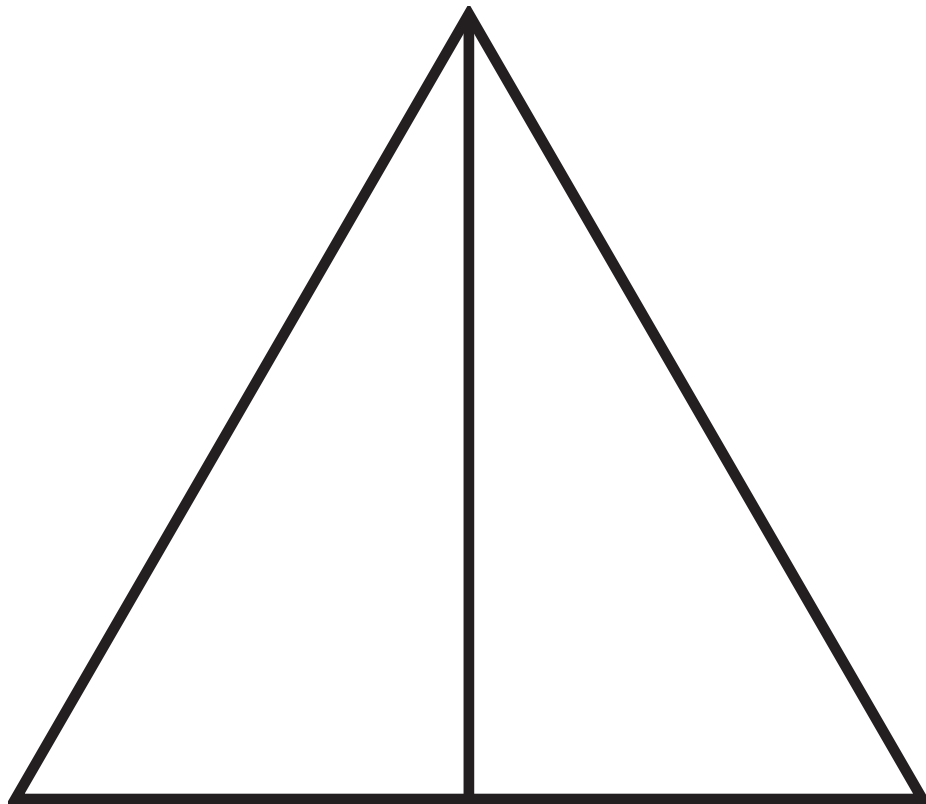
Key:  represents _____ students

ROCK				
POP				
OTHER MUSIC				

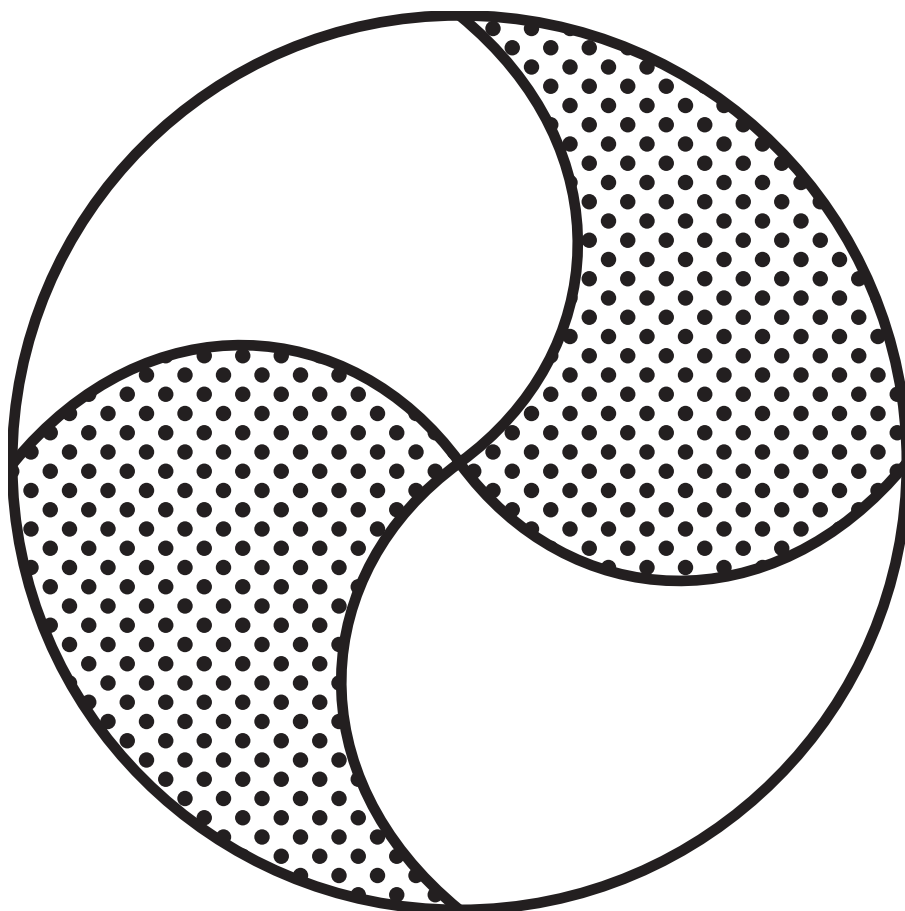
Question 3 (e)

[illegible]

Question 4 (a)

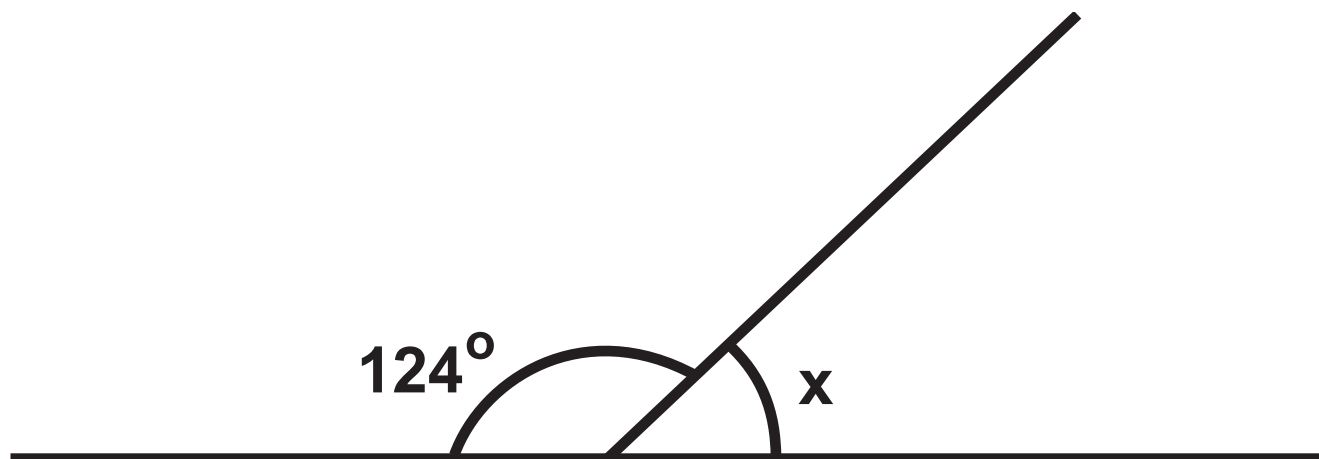


Question 4 (b)



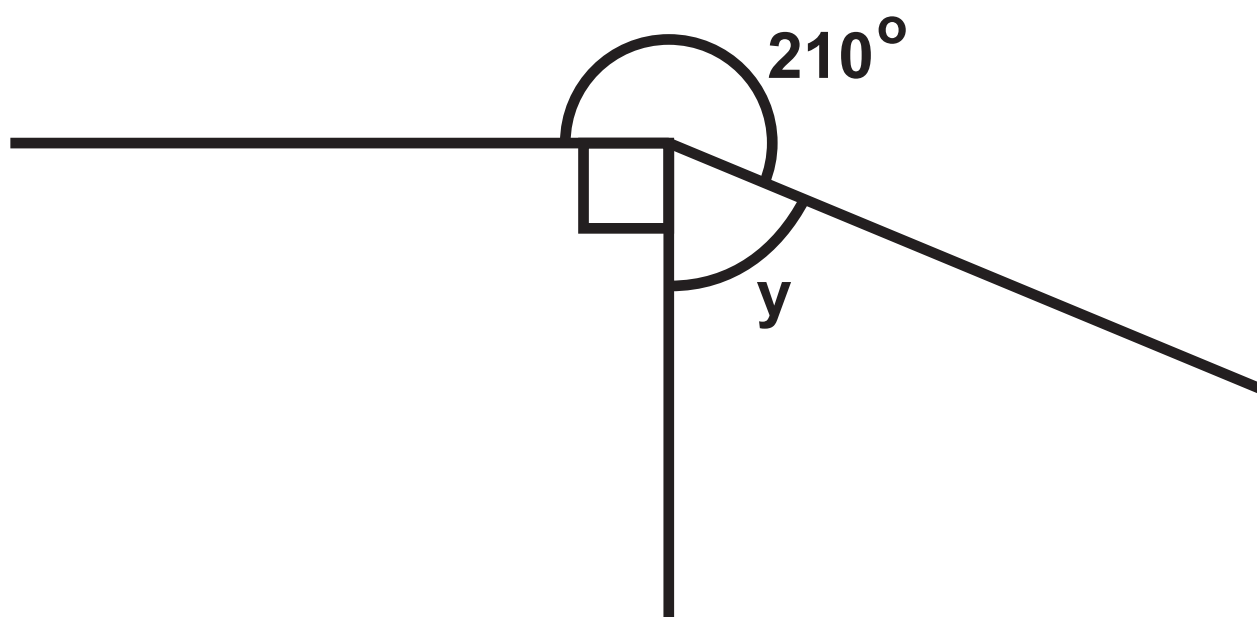
Question 5 (a)

Diagram NOT drawn to scale



Question 5 (b)

Diagram NOT drawn to scale

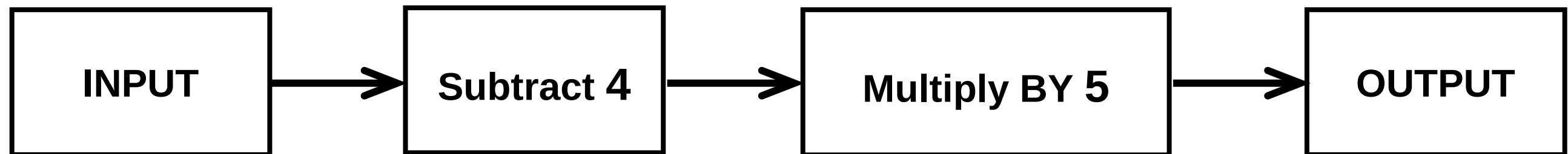


Question 8 (a)

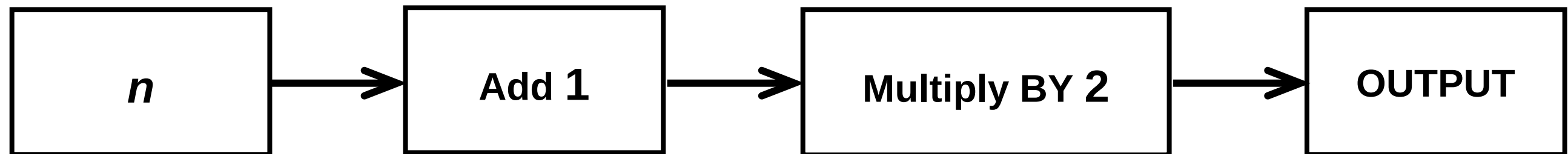
Table

	50p	20p	10p	5p
Number of each coin	1			
		2	1	
		2		2
		1	3	
		1	2	2
		1		
			5	
			4	
			1	8
				10

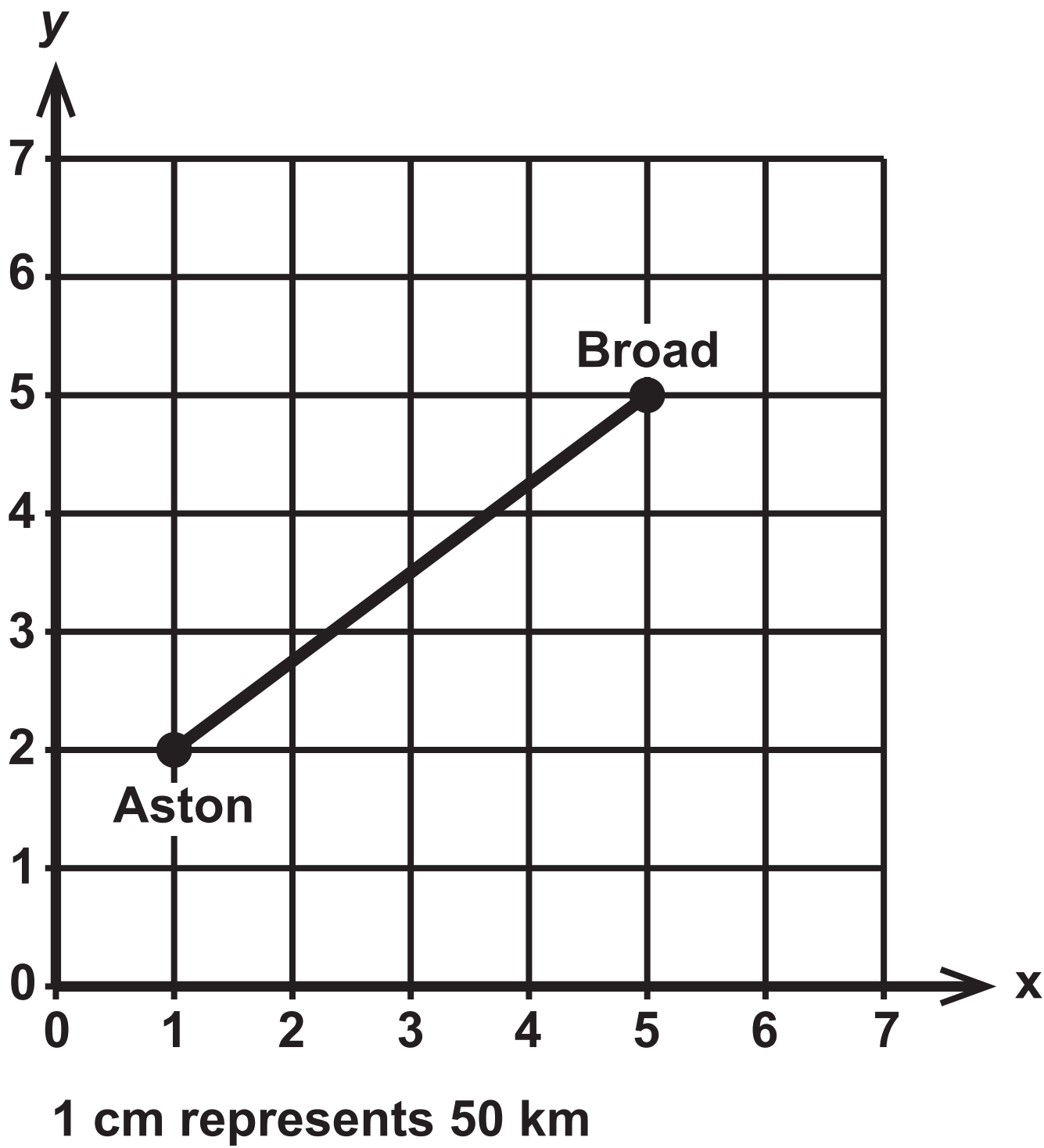
Question 10 (a)



Question 10 (b)

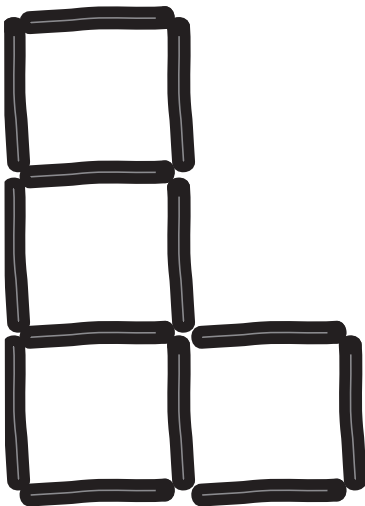


Question 11

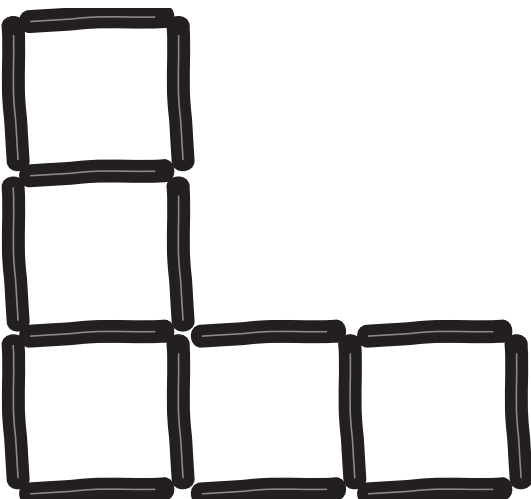


Question 14

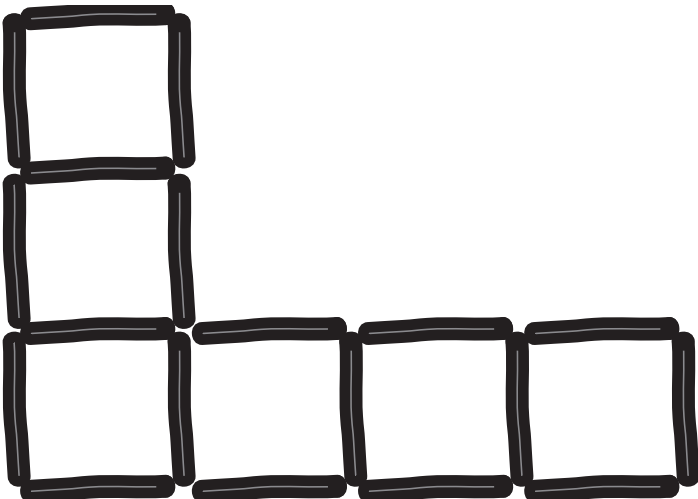
Pattern 1



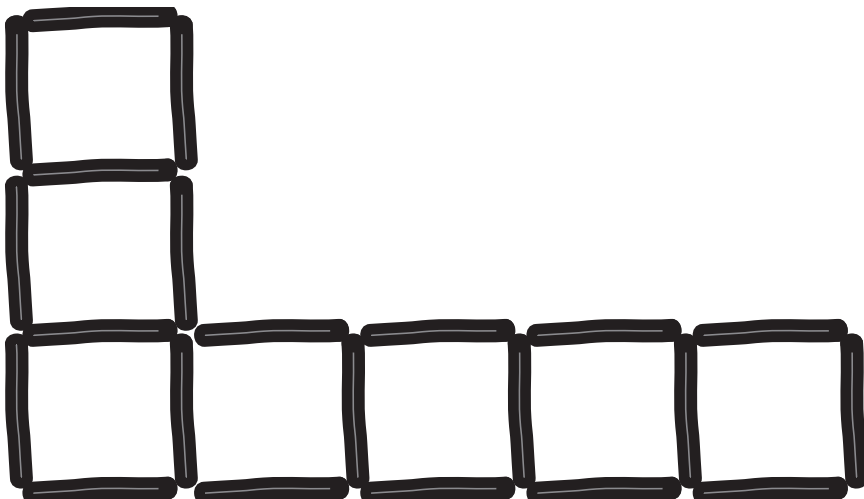
Pattern 2



Pattern 3

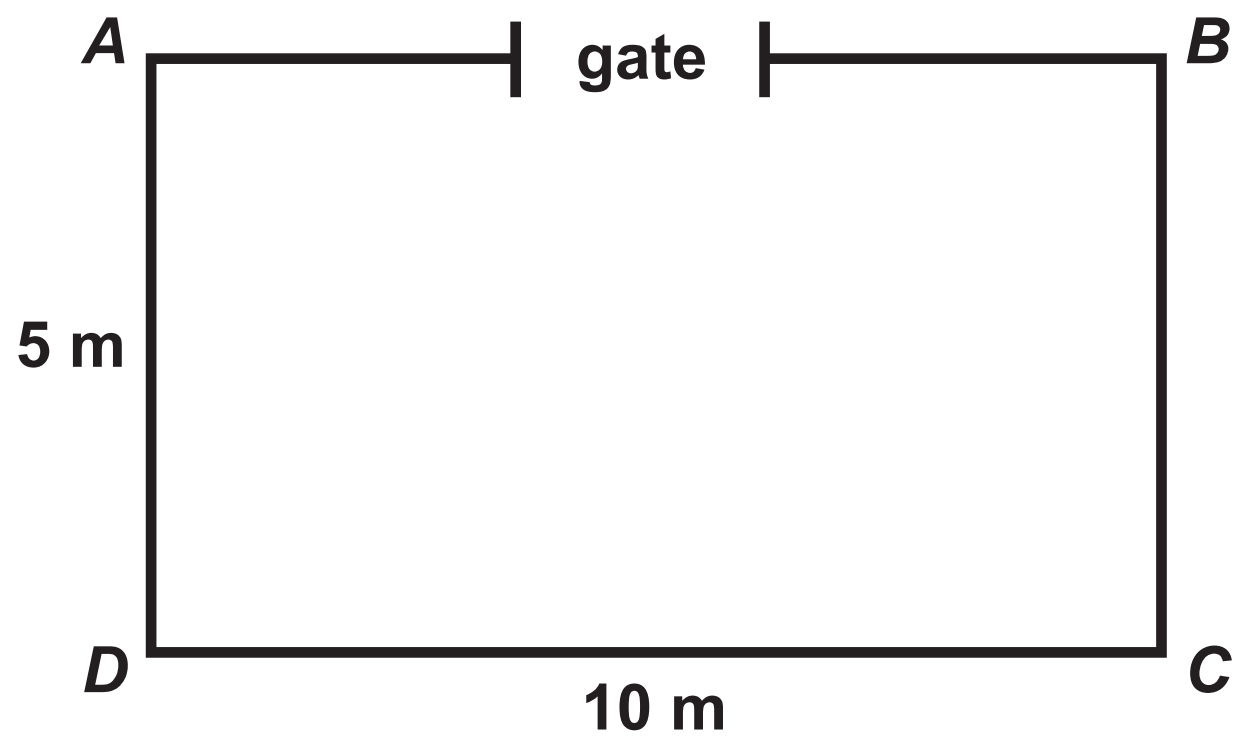


Pattern 4



Question 18

Diagram NOT drawn to scale



Question 22

Information

Too much chocolate is bad for your health.

How many pieces of chocolate did you eat yesterday?

Tick (✓) one box.

1 – 2

☐

3 – 4

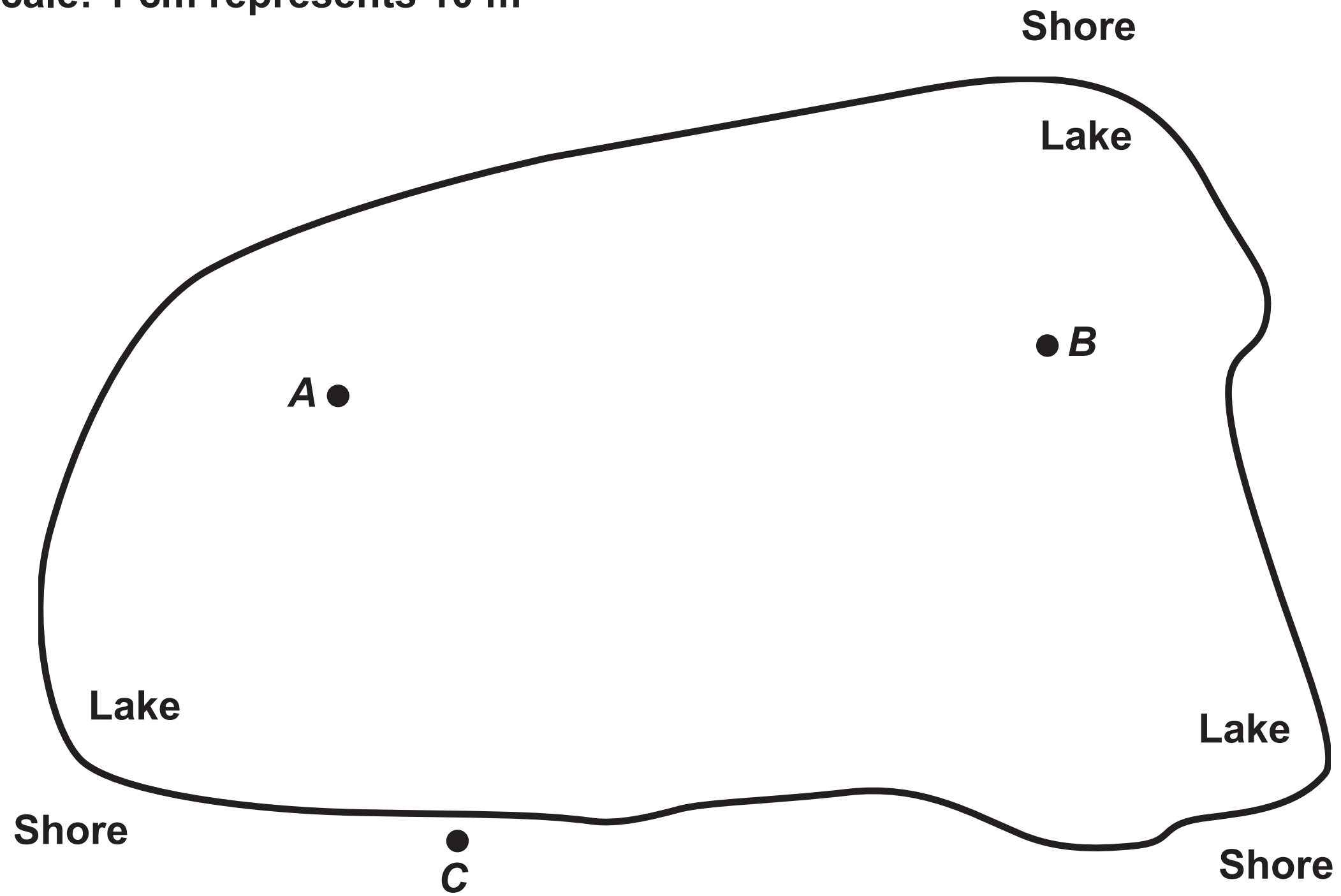
☐

5 – 6

☐

Question 23

Scale: 1 cm represents 10 m

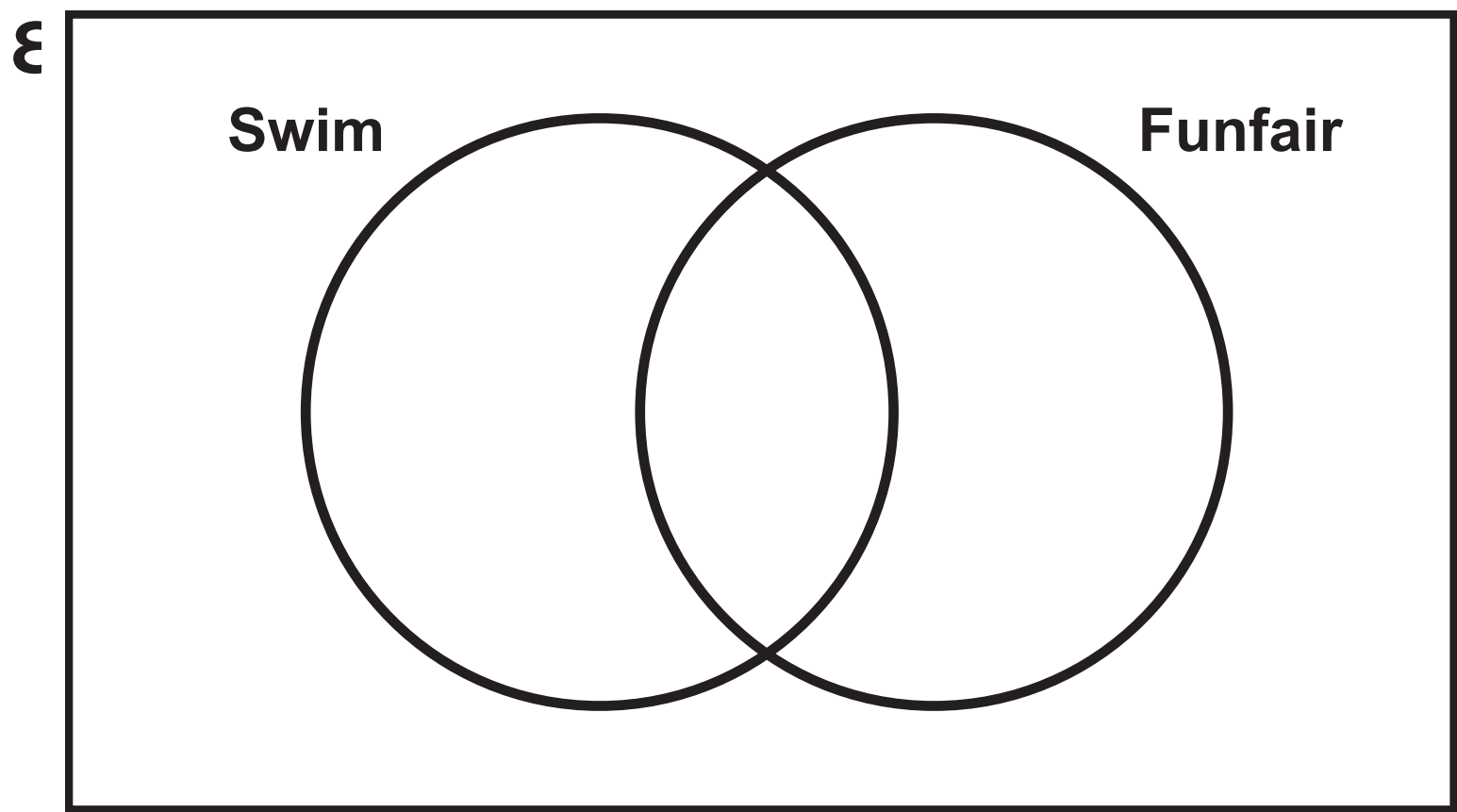


Question 25

Table

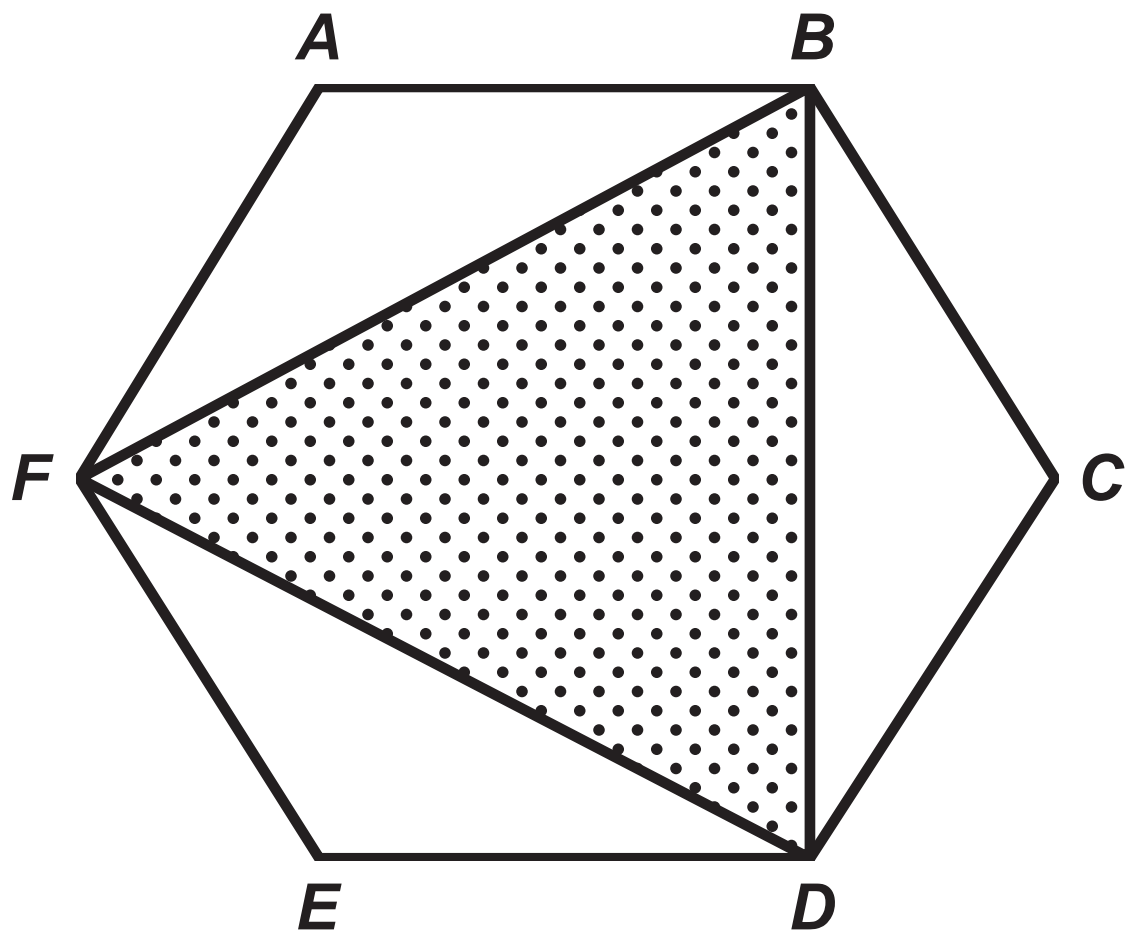
MASS LESS THAN	FULL INSURANCE AGAINST BEING LOST:		
	£250	£750	£1500
100 g	£5	£7	£9
250 g	£7.50	£9.50	£11.50
1000 g	£9.25	£11.25	£13.25
1750 g	£11	£13	£15
2500 g	£13.50	£15.50	£17.50
5000 g	£18	£20	£22

Question 26



Question 27

Diagram NOT drawn to scale





GCSE – NEW
C300U10-1



MATHEMATICS – COMPONENT 1
NON – CALCULATOR MATHEMATICS
FOUNDATION TIER

THURSDAY, 25 MAY 2017 – MORNING

Spare Diagram Booklet

Surname:	
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Candidate Number:	0

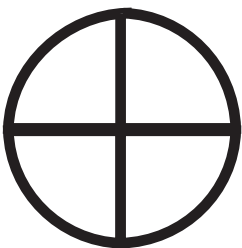
Question 1

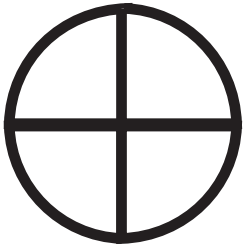
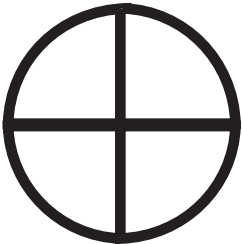
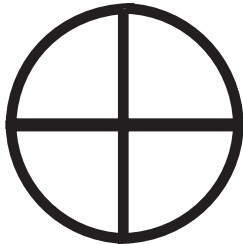
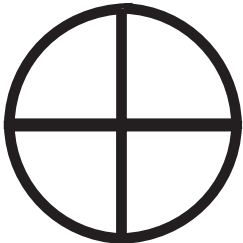
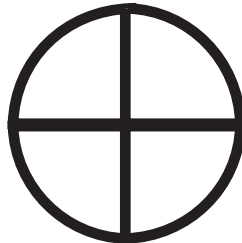
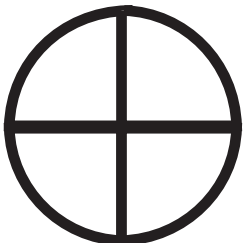
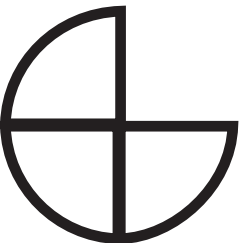
Table

	NUMBER			
WORDS	1	2	8	9
Prime				
Odd	✓			
Even				
Square	✓			
Cube	✓			

Question 3

“What is your favourite type of music?”

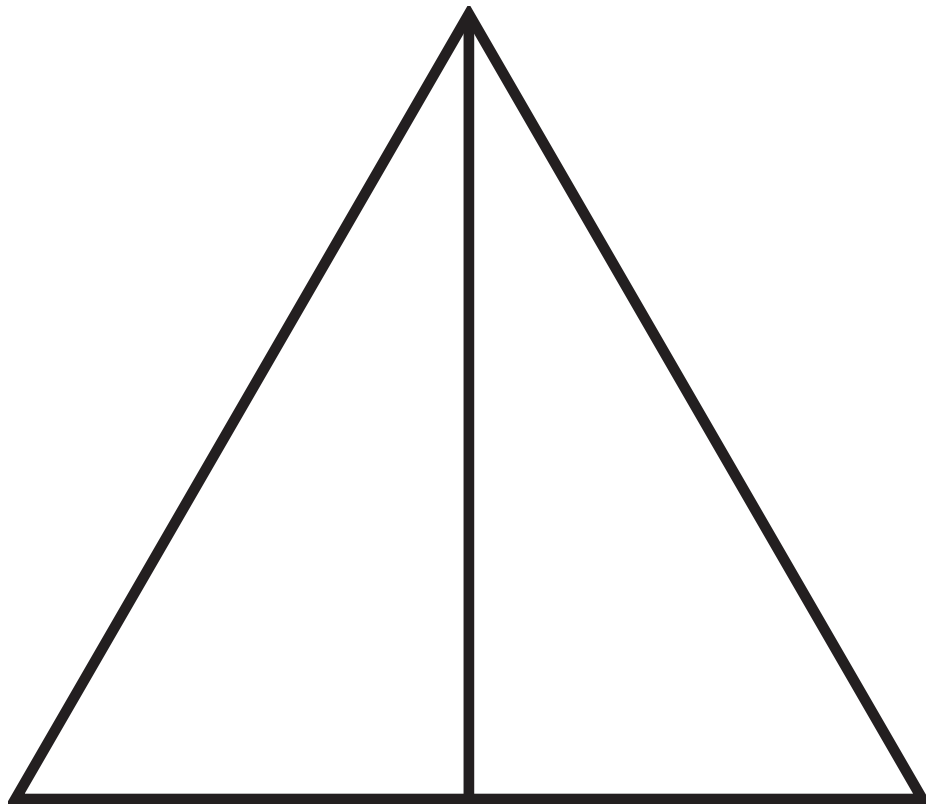
Key:  represents _____ students

ROCK				
POP				
OTHER MUSIC				

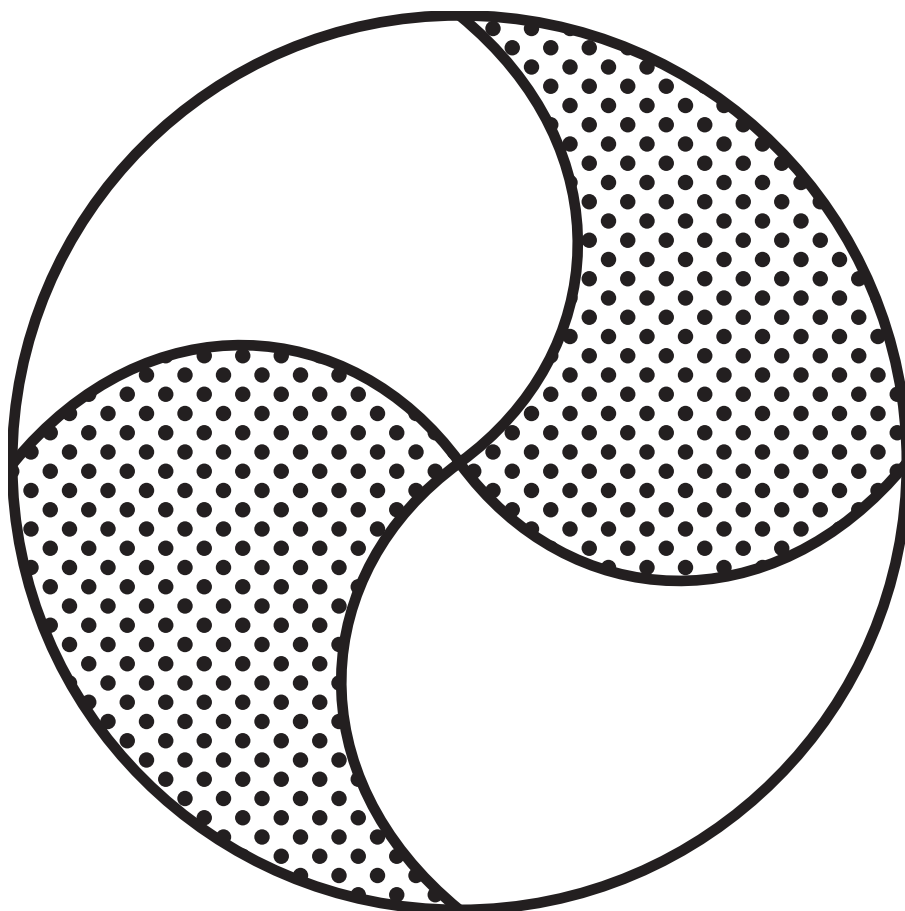
Question 3 (e)

[illegible]

Question 4 (a)

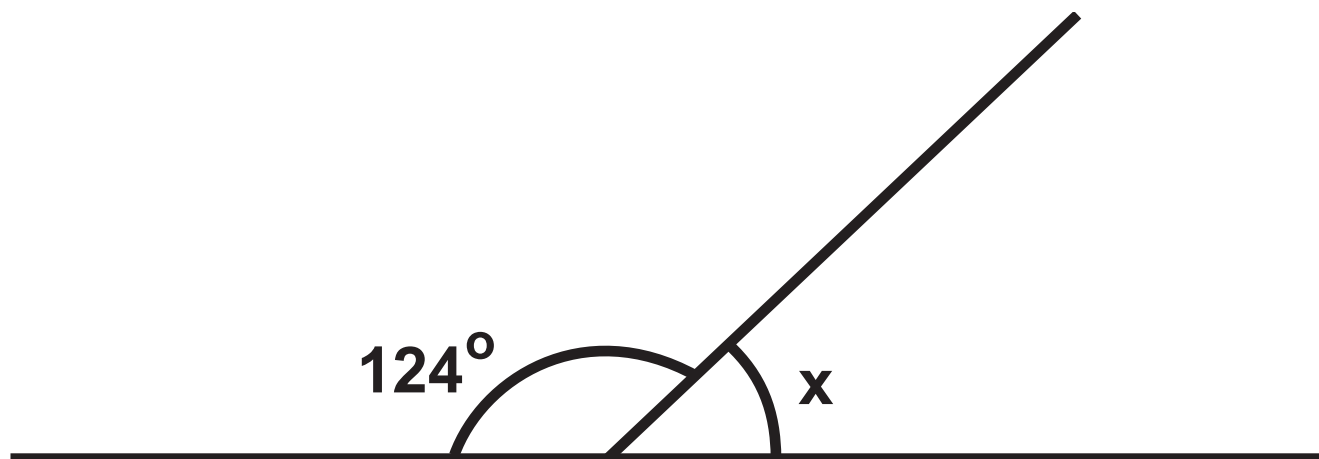


Question 4 (b)



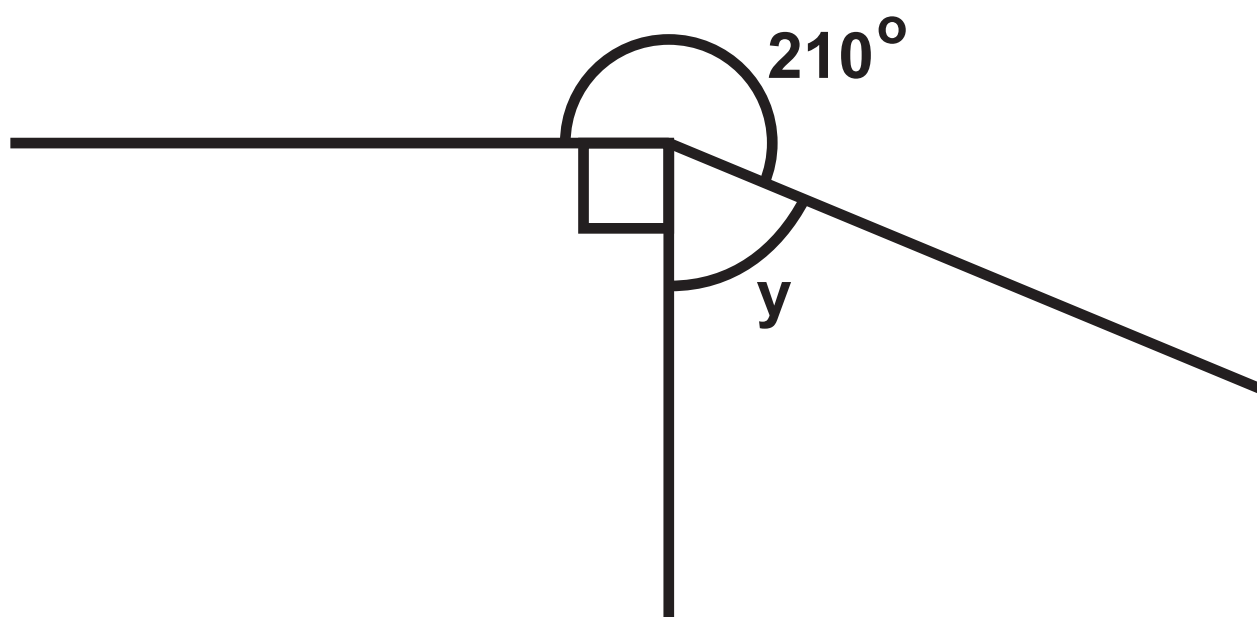
Question 5 (a)

Diagram NOT drawn to scale



Question 5 (b)

Diagram NOT drawn to scale

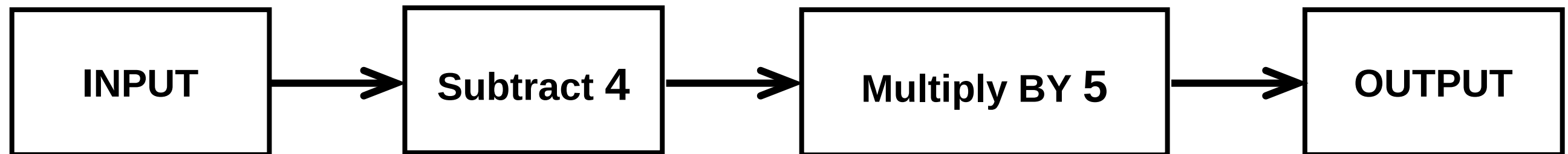


Question 8 (a)

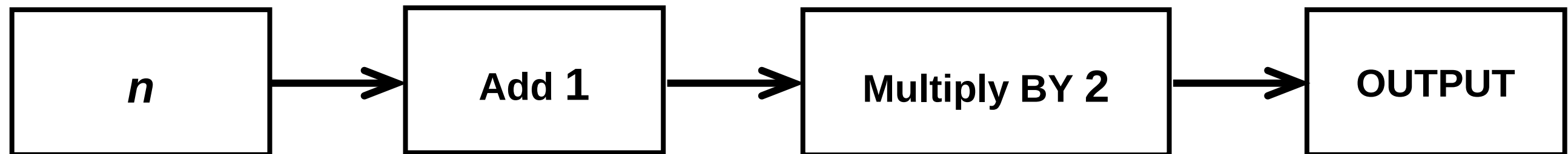
Table

	50p	20p	10p	5p
Number of each coin	1			
		2	1	
		2		2
		1	3	
		1	2	2
		1		
			5	
			4	
			1	8
				10

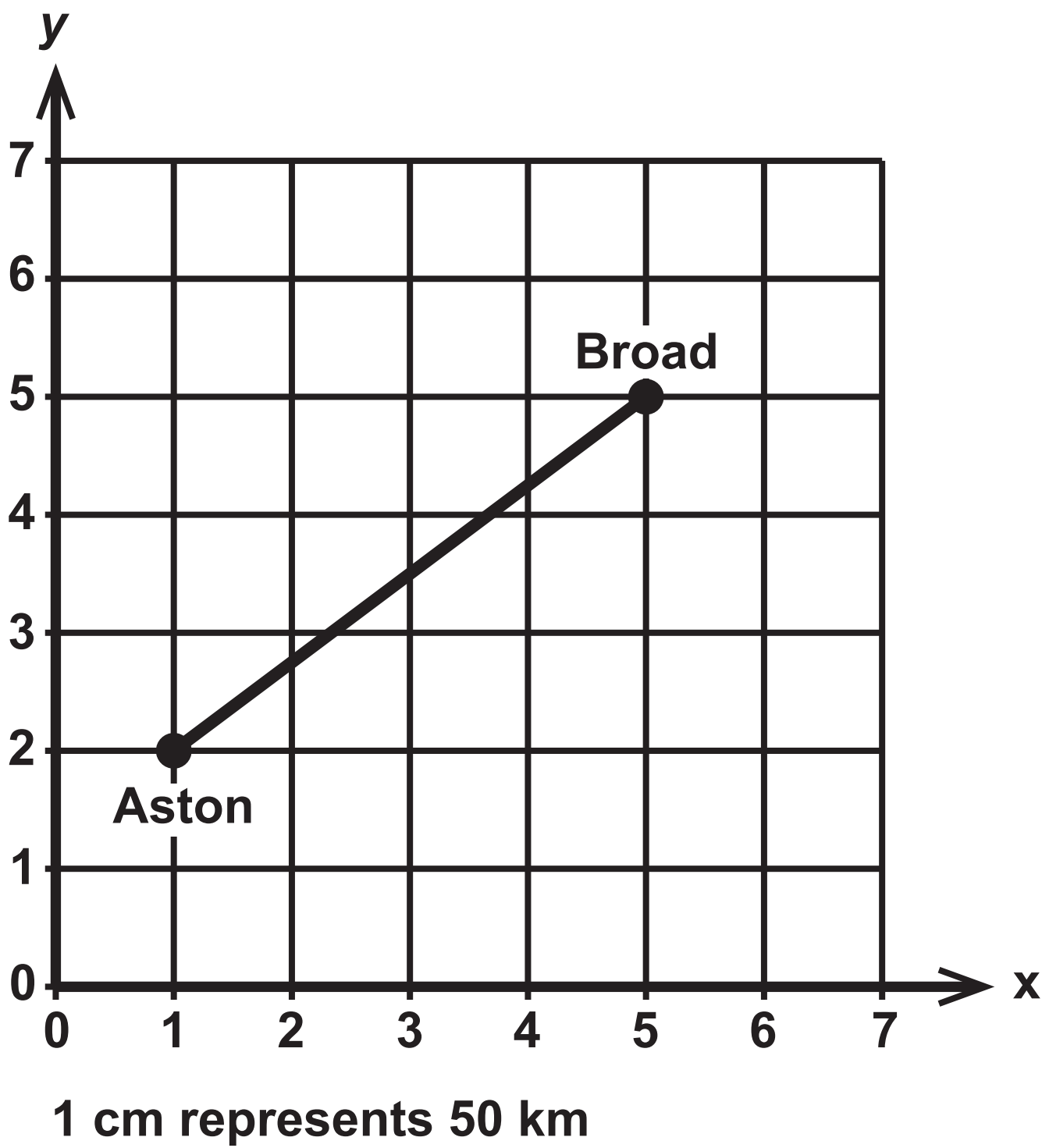
Question 10 (a)



Question 10 (b)

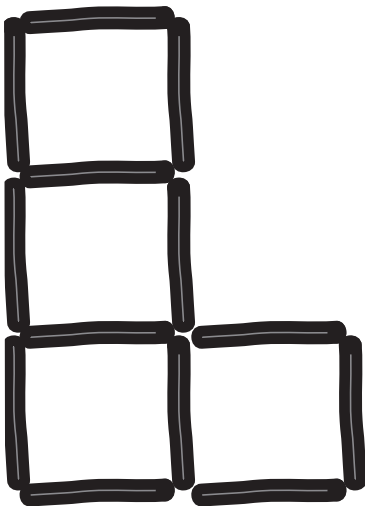


Question 11

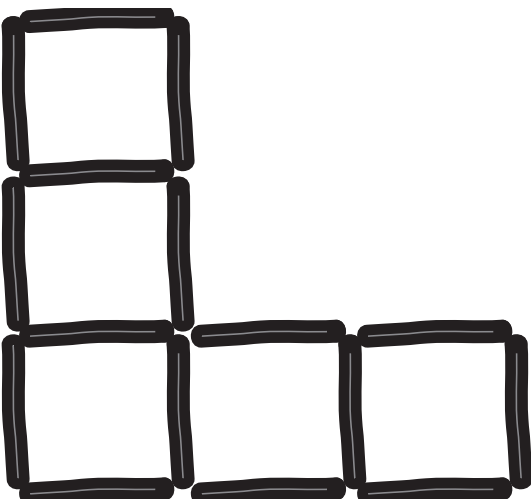


Question 14

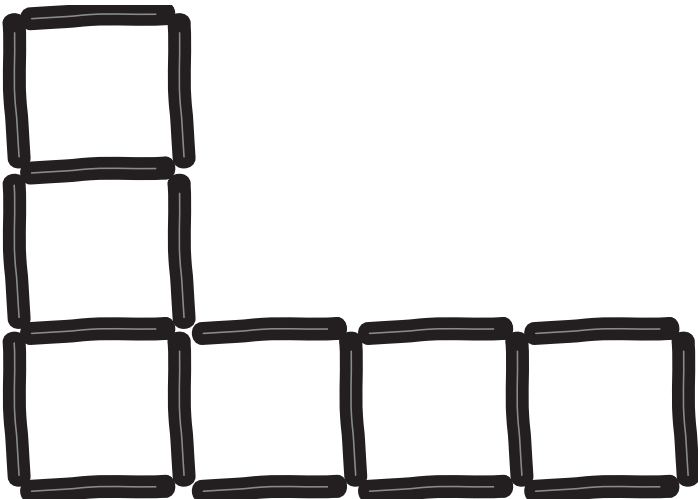
Pattern 1



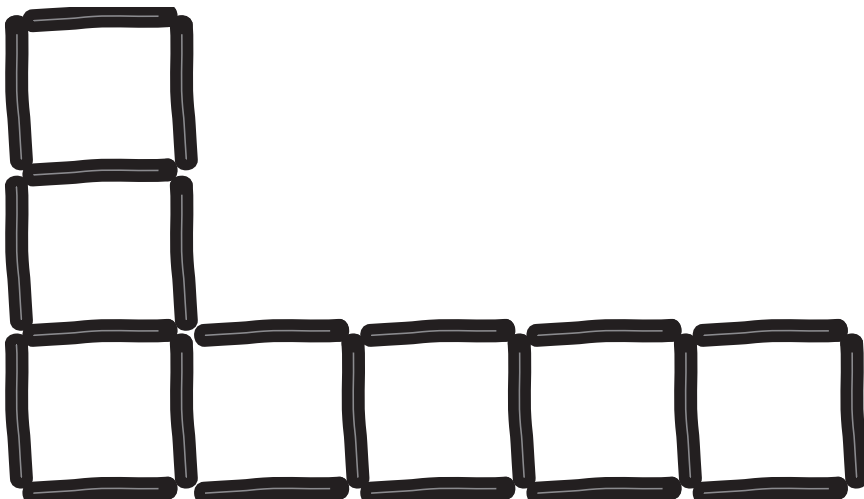
Pattern 2



Pattern 3

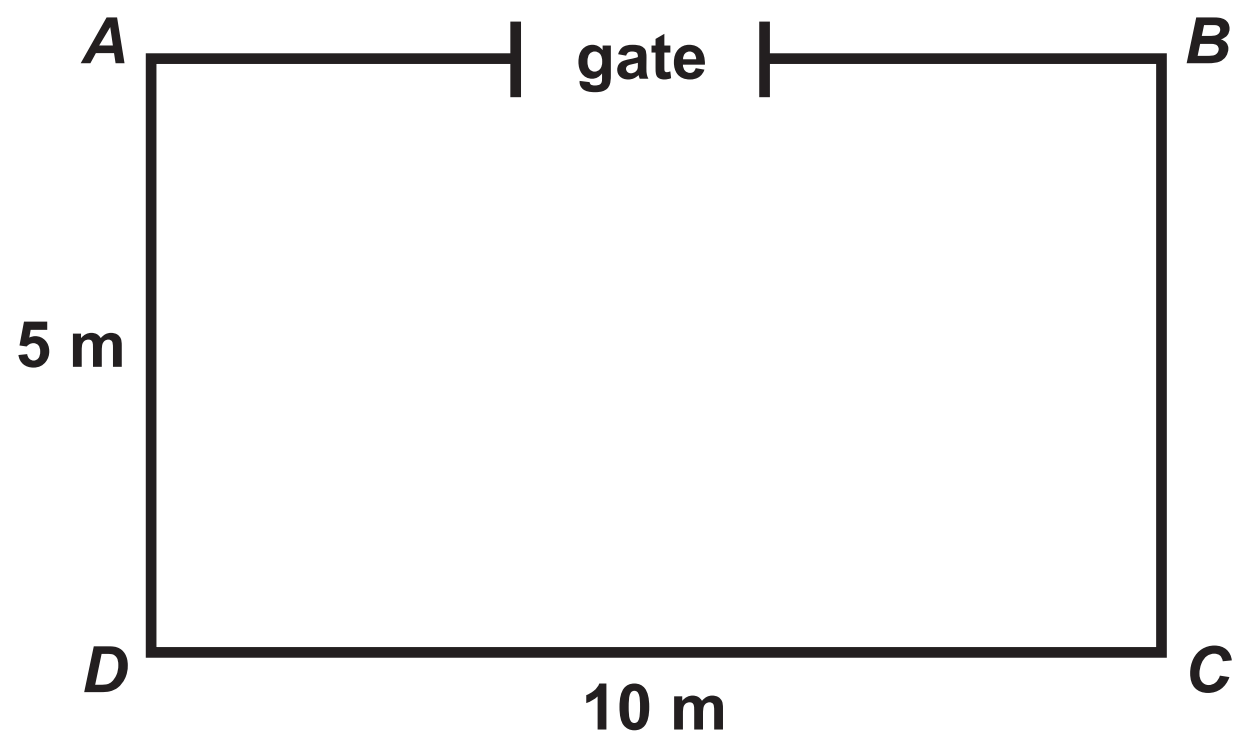


Pattern 4



Question 18

Diagram NOT drawn to scale



Question 22

Information

Too much chocolate is bad for your health.

How many pieces of chocolate did you eat yesterday?

Tick (✓) one box.

1 – 2

☐

3 – 4

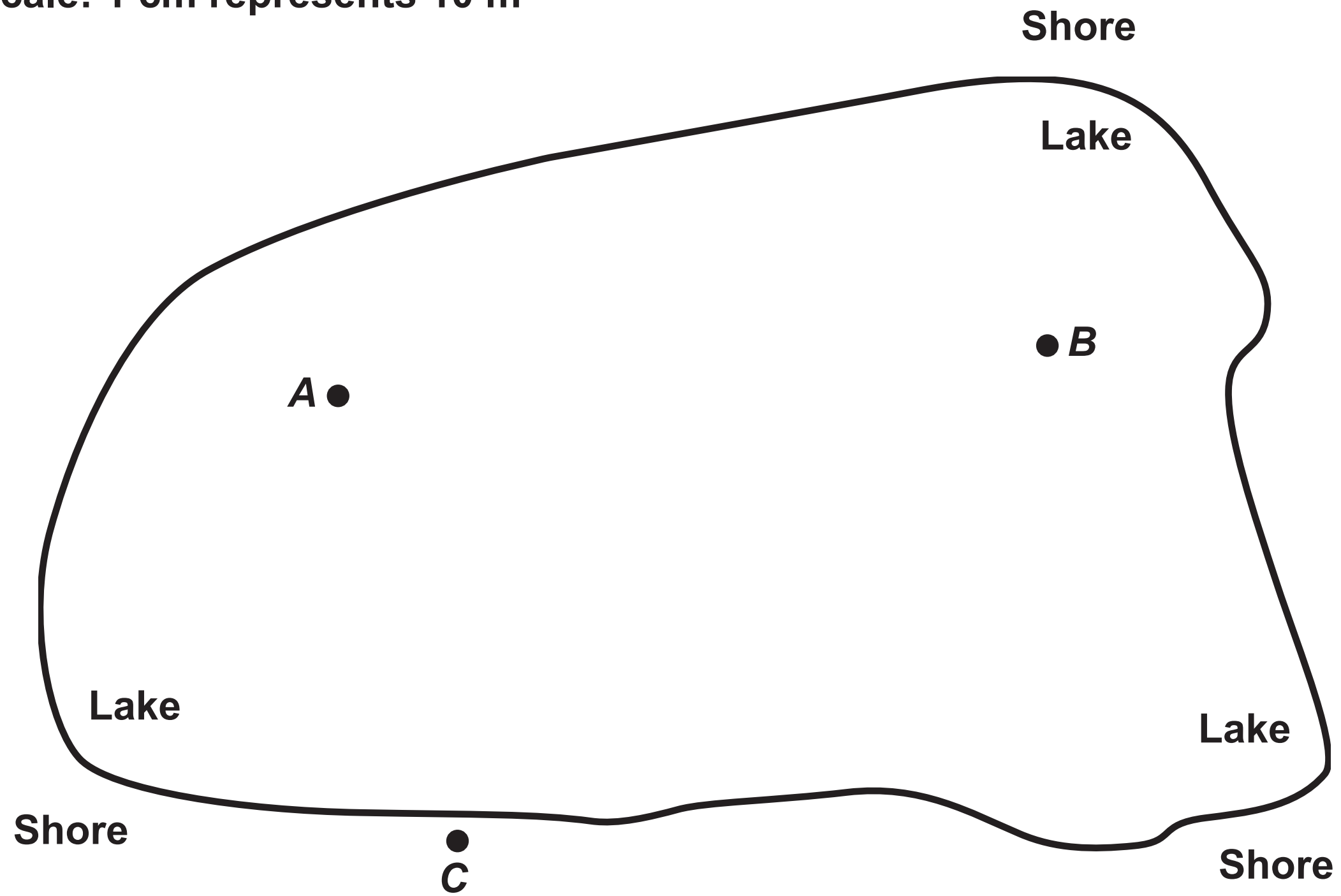
☐

5 – 6

☐

Question 23

Scale: 1 cm represents 10 m

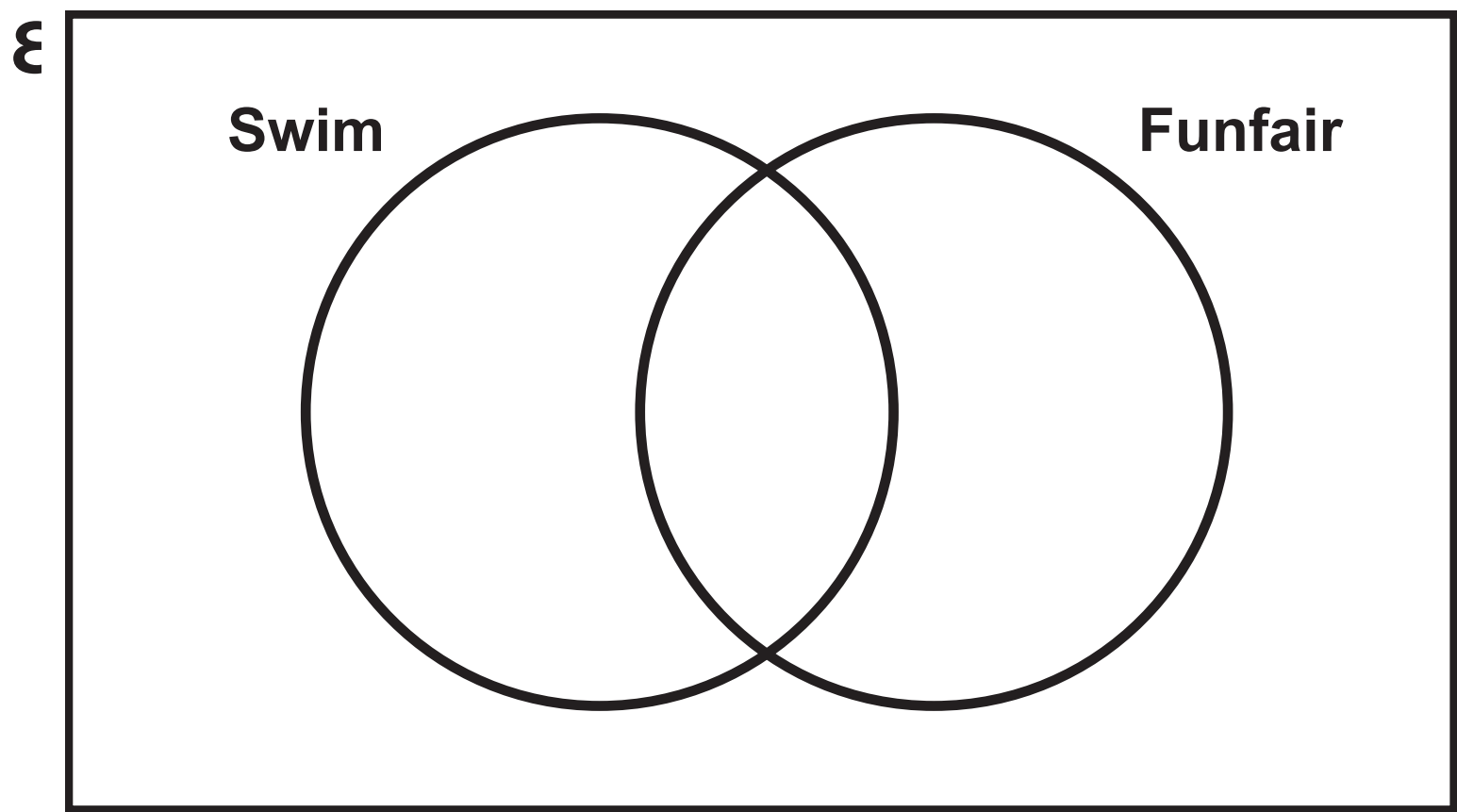


Question 25

Table

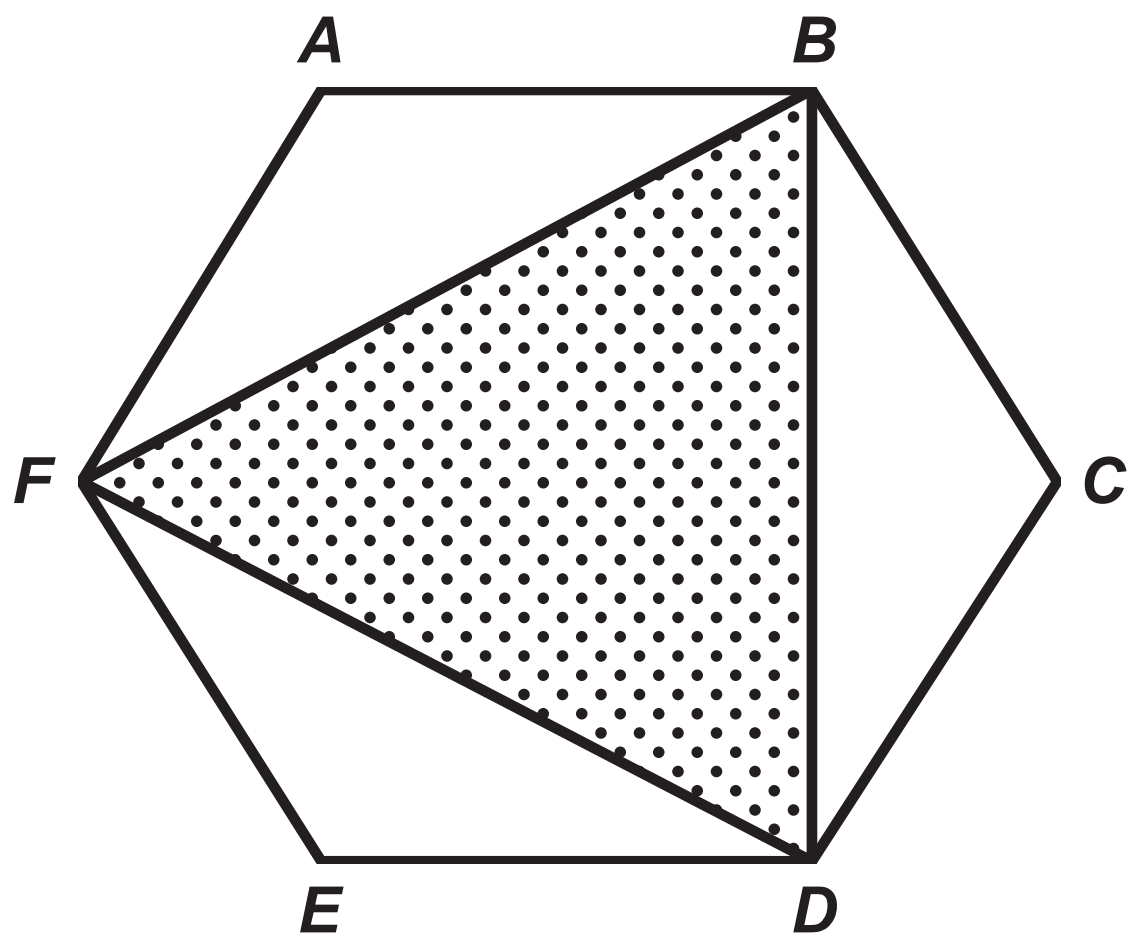
MASS LESS THAN	FULL INSURANCE AGAINST BEING LOST:		
	£250	£750	£1500
100 g	£5	£7	£9
250 g	£7.50	£9.50	£11.50
1000 g	£9.25	£11.25	£13.25
1750 g	£11	£13	£15
2500 g	£13.50	£15.50	£17.50
5000 g	£18	£20	£22

Question 26



Question 27

Diagram NOT drawn to scale



**FORMULA LIST
FOUNDATION TIER
AND HIGHER TIER
GCSE – NEW**

**You must not write on these formula
pages.**

**Anything you write on these formulae
pages will gain NO credit.**

AREA AND VOLUME FORMULAE

Where r is the radius of the sphere or cone,
 l is the slant height of a cone and
 h is the perpendicular height of a cone:

Curved surface area of a cone = $\pi r l$

Surface area of a sphere = $4\pi r^2$

Volume of a sphere = $\frac{4}{3}\pi r^3$

Volume of a cone = $\frac{1}{3}\pi r^2 h$

KINEMATICS FORMULAE

Where a is a constant acceleration,
 u is initial velocity, v is final velocity,
 s is displacement from the position
when $t = 0$ and t is time taken:

$$v = u + at$$

$$s = ut + \frac{1}{2}at^2$$

$$v^2 = u^2 + 2as$$