GCSE – NEW

3310U40-1

MATHEMATICS – NUMERACY

UNIT 2:

CALCULATOR – ALLOWED

INTERMEDIATE TIER

THURSDAY,

8 JUNE 2017 – MORNING

1 hour 45 minutes

(plus your additional time allowance)

A CALCULATOR WILL BE REQUIRED FOR THIS PAPER

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	3	
2.	3	
3.	3	
4.	2	
5.	3	
6.	9	
7.	5	
8.	5	
9.	12	
10.	3	
11.	2	
12.	4	
13.	8	
14.	4	
15.	8	
16.	6	
Total	80	

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.

Models for Question 14.

Cut out shape for Question 6 (b).

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 $3{\cdot}14$ or use the π button on your calculator.

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.

In question 9 (b), the assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing.

1. Look at the information provided for Question 1 in the separate Diagram Booklet.

The information shows a bus timetable.

(a) At what time does the first bus after 09:00 leave Orme Station?

Circle your answer.

09:05	**09:12**	**09:18**	**09:24**	**09:30**

[1 mark]

Question 1 continued

1. (b) Gwil looks at the timetable shown.

He decides to take the latest possible bus to be at Outlet Village by 15:00

At what time will Gwil arrive at Outlet Village?

You must show all your working.

[2 marks]

2. Luigi lives in south Wales.

Rosina lives in west Wales.

For each of the first **65** days of **2017**,

they recorded whether or not it rained.

Luigi recorded that it rained on

28 of these days.

Rosina recorded that it rained on

40% of these **65** days.

Luigi says,

‘For the first **65** days of **2017**, there were more days with rain where I live than where Rosina lives.’

Is Luigi correct?

You must show all your working.

[3 marks]

3. Look at the diagram for Question 3 in the separate Diagram Booklet.
The diagram shows two pie charts.

Tomos is looking at gym memberships for HADON'S GYM and WORKOUT PALACE. Each of these gyms displays its membership in a pie chart.

(a) About what percentage of the members at HADON'S GYM are children?
Circle your answer.

10%	**20%**	**30%**	**40%**	**50%**

[1 mark]

Question 3 continued

3. (b) Which of the following is the best estimate for the percentage of the members at WORKOUT PALACE who are women? Circle your answer.

25%	**28%**	**30%**	**32%**	**38%**

[1 mark]

Question 3 continued

3. (c) Tomos says,

‘There are more men with membership at HADON’S GYM than at WORKOUT PALACE.’

Is Tomos CERTAIN to be correct?
You must give a reason for your answer.

Yes ☐ **No** ☐

_____

_____

_____

_____

_____

_____

[1 mark]

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

The diagram is a scatter diagram.

A group of friends measured the heights and masses of their pets.

The scatter diagram shows the results.

(a) Describe the correlation shown by this scatter diagram.

_____

_____

[1 mark]

(b) The friends notice that the tallest pet has the same mass as another pet.

What is the height of this other pet?

_____ **cm**

[1 mark]

5. Glenda plans to drive from Flint to Cardiff.

On a long journey, her average speed is usually 42 mph.

Last time she drove from Flint to Cardiff it took her $3\frac{1}{2}$ hours.

(a) Use this information to calculate the distance between Flint and Cardiff.

_____

_____

_____

_____

_____

_____

_____ **miles**

[2 marks]

Question 5 continued

5. (b) Give a possible reason why your answer in (a) is only an estimate of the distance between Flint and Cardiff.

[1 mark]

6. (a) Look at the information provided for Question 6 (a) in the separate Diagram Booklet.

The information is a recipe.

Gustav is making some scones for his sister's birthday party.

(i) How much self raising flour will Gustav need to make 30 scones?

Circle your answer.

900 g	**1000 g**	**1100 g**	**1125 g**	**1350 g**

_____

_____

[1 mark]

continued on the next page . . .

Question 6 (a) continued

6. (a) (ii) In the recipe, the temperature of the oven is given in degrees Fahrenheit, F.

The temperature gauge on Gustav's oven shows degrees Celsius, C.

The formula below is used to convert Fahrenheit into Celsius.

$$C = \frac{5F - 160}{9}$$

At what temperature should Gustav bake the scones?

Give you answer in degrees Celsius.

_____

_____

_____

_____ °C

[2 marks]

(b) Look at the diagram for Question 6 (b) in the separate Diagram Booklet.
The diagram is NOT drawn to scale.

Gustav also makes a birthday cake for his sister.
The top face of the cake is in the shape of a trapezium.

Gustav plans to ice the top face of the cake.
Each packet of icing costs £1.35 and is enough to cover 65 cm^2
He has to buy complete packets of icing.

continued on the next page . . .

Question 6 (b) continued

6. (b) (i) Calculate the area of the top face of the cake Gustav has made.

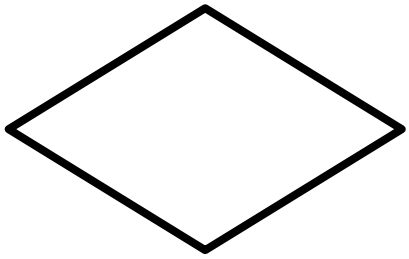
[2 marks]

(ii) How much will it cost Gustav to ice the top face of the cake?
You must show all your working.

[3 marks]

Question 6 continued

6. (b) (iii) Gustav also plans to decorate the cake with small pieces of marzipan shaped as shown below.



The top face of each piece of marzipan is a rhombus. Will these pieces of marzipan tessellate?

Yes ☐ **No** ☐

On the paper provided for Question 6 (b) (iii) in the separate Diagram Booklet, draw a simple diagram to support your answer.

A cut out shape is provided for this question.

[1 mark]

7. Look at the diagram for Question 7 in the separate Diagram Booklet.

The diagram shows a conversion graph.

Alun has made his own conversion graph to change knots to miles per hour.

(a) Use Alun's conversion graph to write 150 knots in miles per hour.

[1 mark]

Question 7 continued

7. (b) Nikita thinks Alun's conversion graph may be inaccurate.

Nikita knows that 1000 knots is 1150.779 miles per hour, correct to 3 decimal places.

Convert 20 knots to miles per hour

- **using Alun's conversion graph, and then**
- **using Nikita's values.**

Calculate the difference, in miles per hour, between your answers.

Give your answer correct to 2 decimal places.

You must show all your working.

[4 marks]

8. (a) Look at the diagram for Question 8 (a) in the separate Diagram Booklet.
The diagram shows a graph.

Miss Rashud gave her Year 9 French class a test on Wednesday.
She asked her class to spell 12 different words.
She displays the results as shown.

(i) How many pupils scored MORE THAN 9 in the test?

_____

_____

[1 mark]

(ii) How many pupils are there in Miss Rashud's French class?

_____

_____

[1 mark]

Question 8 continued

8. (a) (iii) What assumption have you made in answering part (ii)?

_____

_____

_____

[1 mark]

(b) Look at the diagram for Question 8 (b) in the separate Diagram Booklet.
The diagram shows a graph.

Miss Rashud also gave the same test to her Year 10 French class on Wednesday. She asked her class to spell the same 12 words.
She displays the results as shown.

continued on the next page . . .

Question 8 (b) continued

8. (b) (i) Leon says,

‘By looking at the YEAR 10 graph, I think there is very little difference between the mode and the mean for these scores.’

Without calculating the mean, explain whether Leon is correct or not.

Correct ☐ **Not correct** ☐

_____

_____

_____

_____

_____

[1 mark]

continued on the next page . . .

Question 8 (b) continued

8. (b) (ii) Catrin looks at the two sets of data Miss Rashud has displayed.

She says,

'Year 10 are better at spelling than Year 9.'

Is Catrin's statement correct?
You must give values to support your answer.

Catrin is correct ☐ **Catrin is incorrect** ☐

_____

_____

_____

_____

_____

[1 mark]

9. (a) Look at the diagram for Question 9 (a) in the separate Diagram Booklet.
The diagram shows a map of Wales.

ORGANICS4U is planning to have its headquarters in Wales.
The manager has instructed Ffion to look for a site for the headquarters.

Here are the instructions that Ffion has been given by her manager.

'Find the point that is

- **an equal distance between Wrexham and Aberporth, and**
- **an equal distance between Caernarfon and Swansea.**

The new headquarters needs to be within 20 miles of this point.'

On the map, shade the region, IN WALES, that Ffion should identify for her manager.

[4 marks]

Question 9 continued

9. (b) IN THIS PART OF THE QUESTION, YOU WILL BE ASSESSED ON THE QUALITY OF YOUR ORGANISATION, COMMUNICATION AND ACCURACY IN WRITING.

ORGANICS4U has 16 vehicles on the road every working day.

The company has 6 vans and 10 trucks.

Look at the information provided for Question 9 (b) in the separate Diagram Booklet.

Ffion has the information shown for each type of vehicle.

The fuel used by all of the 16 vehicles costs £1.10 per litre.

Use this information to calculate the TOTAL fuel bill for 1 working day.

You must show all your working.

[6 marks + 2 marks OCW]

10. Mali's scooter depreciated (decreased) in value by 24% in the FIRST year.

In all further years, her scooter depreciated by 13% of its previous year's value.

She originally paid £850 for her scooter.

Calculate the value of Mali's scooter after 7 years.

After 7 years, the value of Mali's scooter was £ _____

[3 marks]

11. Sanjay stacks three boxes in a pile.

The heights of the boxes are 25 cm, 36 cm and 47 cm.

They are all measured correct to the nearest centimetre.

What is the greatest possible height of the stack of the three boxes?

Greatest possible height of the stack of three boxes is _____ cm

[2 marks]

12. Look at the diagram for Question 12 in the separate Diagram Booklet.
The diagram is NOT drawn to scale.

Ursula is lying on her surfboard 180 metres away from the foot of a vertical cliff.
The height of the cliff is 146 metres.

Ursula was told that if the angle of elevation of the top of the cliff from her lying position is between 42° and 45°, it is safe for her to attempt to stand on her surfboard.

Calculate the angle of elevation of the top of the cliff from Ursula's position lying on her surfboard.

State whether it is

- safe for Ursula to attempt to stand, or
- not safe as she is too near the cliff, or
- not safe as she is too far out at sea.

_____

_____

[4 marks]

13. Look at the diagram for Question 13 in the separate Diagram Booklet.
The diagram is NOT drawn to scale.
The diagram represents a television.

Marta buys a new television.

(a) Marta wants to fit the television in a bookcase on the wall.
In the shop she forgot to write down the length of the television.
She did write down the height and the diagonal of the screen.

The height of the screen is 16 inches.

The diagonal of the screen is 44 inches.

Marta needs to know the length of the screen before she opens the box, in case she wants to return the television.
Calculate the length of the screen.
Give your answer correct to 2 significant figures.

Length is _____ inches,

correct to 2 significant figures.

[4 marks]

Question 13 continued

13. (b) The television was reduced in the sale by 26% of its original price.

It cost Marta £710.40 in the sale.

What was the original price of the television?

Original price £ _____

[2 marks]

Question 13 continued

13. (c) A television uses 1 unit of electricity every 10 hours.

A unit of electricity costs 9.8p.

(i) Calculate the cost of having a television turned on for 24 hours.

Circle your answer.

£23.52	£2.35	40.83p	23.52p	2.45p

_____

_____

_____

_____

_____

[1 mark]

continued on the next page . . .

Question 13 (c) continued

13. (c) (ii) On average, Marta watches 4 hours of television each day.
On average, how much A WEEK does it cost her to watch television?
Circle your answer.

27.44p	**£27.44**	**£39.20**	**39.2p**	**10.78p**

[1 mark]

14. Ask for the models for Question 14.

The models are NOT made to scale.

Model 1 represents Elin's old fish tank.

Model 2 represents Elin's new fish tank.

Elin's old fish tank is leaking.

The old fish tank is in the shape of a cuboid. (Model 1)

The base of this tank measures 60 cm by 40 cm.

Before the leak, the height of the water level in Elin's old fish tank was 45 cm.

Elin decides to replace her fish tank with a cylindrical one. (Model 2)

She selects a new cylindrical fish tank that has a radius of 25 cm and a height of 70 cm.

Will all the original contents, including the water, fit into this cylindrical tank?

You must show all your working.

[4 marks]

15. Look at the diagram for Question 15 in the separate Diagram Booklet.
The diagram shows a hand.

Simon plans to make gloves.

(a) One morning, Simon decided to carry out a survey to find the mean hand span of people in Wales.

He decided to sample systematically.
He decided to sample from the first 240 people who pass him in the street during the morning.

He wanted to take 20 people's hand span measurements.
Explain how Simon could use systematic sampling to obtain 20 measurements.

[1 mark]

15. (b) Look at the table for Question 15 (b) in the separate Diagram Booklet.

Yesterday morning, Simon only managed to sample 10 people. He calculated the mean hand span of these 10 people to be 22•8 cm.

Yesterday afternoon, Simon recorded the hand spans of a FURTHER 20 people, shown in the table.

Calculate an estimate of the mean of all 30 HAND SPANS that Simon measured yesterday.

[6 marks]

Question 15 continued

15. (c) What could Simon do to improve his estimate of the mean hand span of people in Wales?

[1 mark]

16. Look at the diagrams for Question 16 in the separate Diagram Booklet.
The diagrams are NOT drawn to scale.

Diagram (i) shows where Levi wants to attach a string of lights to his house.
Levi wants to attach a single string of lights from *B* to *A* and then from *A* to *C*.

Diagram (ii) shows the measurements Levi has taken.

He spends £410 at the electrical store buying a string of lights.
After putting up the lights, Levi finds he has 6 metres of the string of lights left over at one end.

How much did the electrical store charge Levi, per metre, for the string of lights?

_____

_____

_____

[6 marks]

END OF PAPER

TOTAL 80 MARKS

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

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GCSE – NEW

3310U40-1

MATHEMATICS – NUMERACY

UNIT 2: CALCULATOR – ALLOWED

INTERMEDIATE TIER

THURSDAY, 8 JUNE 2017 – MORNING

Diagram Booklet

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

Question 1

Information

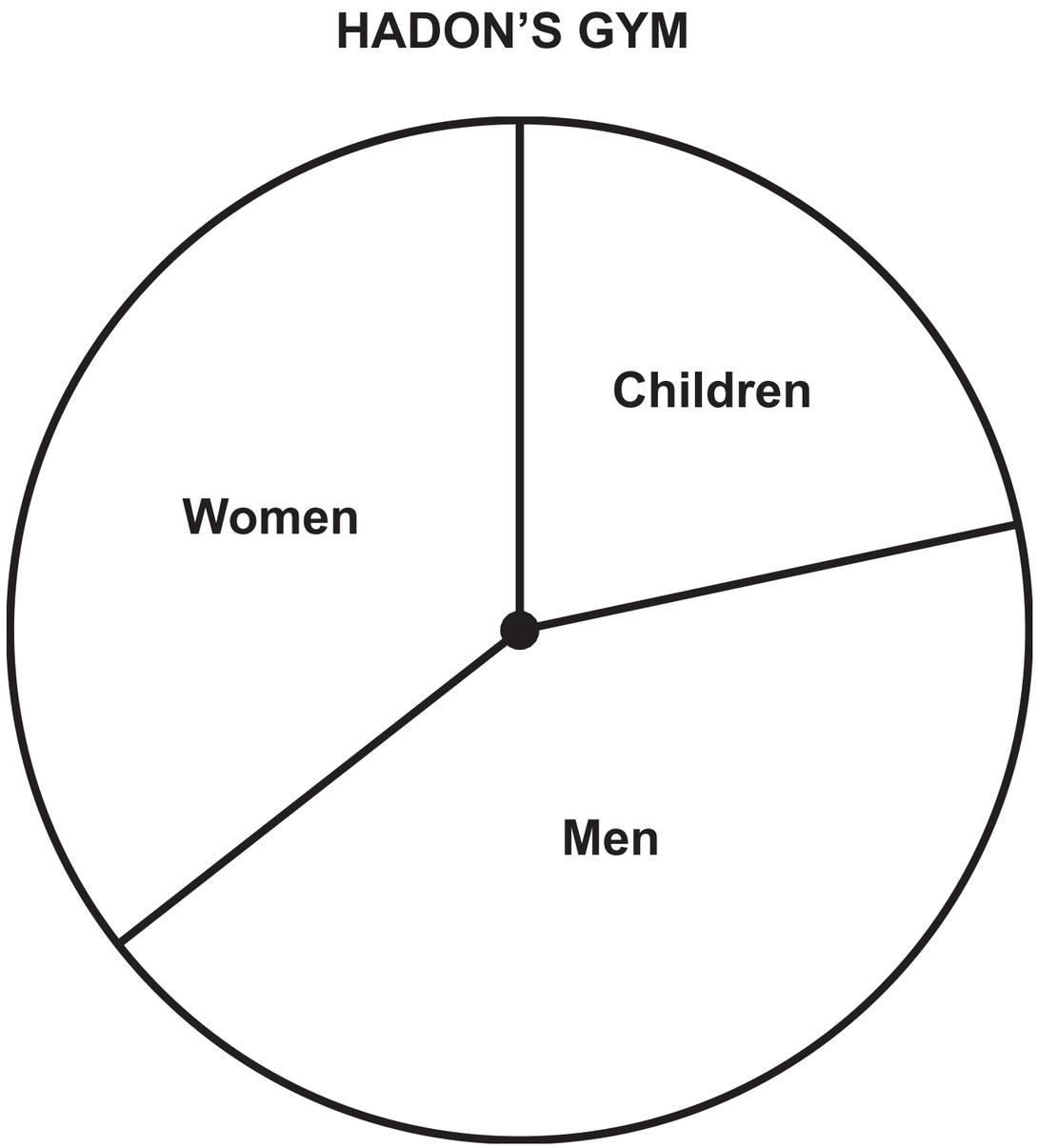
BUS TIMETABLE FROM ORME STATION TO OUTLET VILLAGE

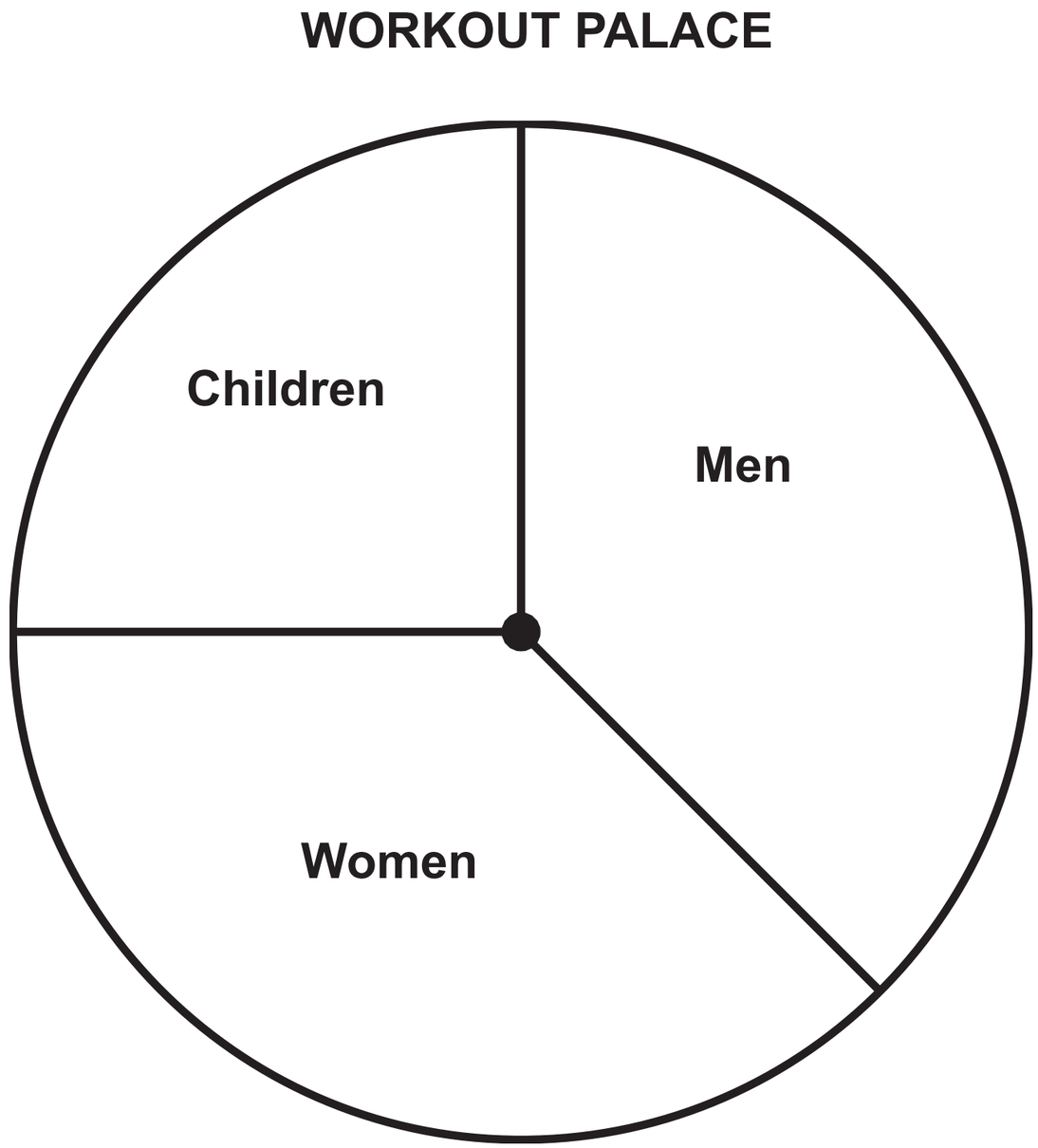
Only 55 minutes from Orme Station direct to Outlet Village

Buses leave the station

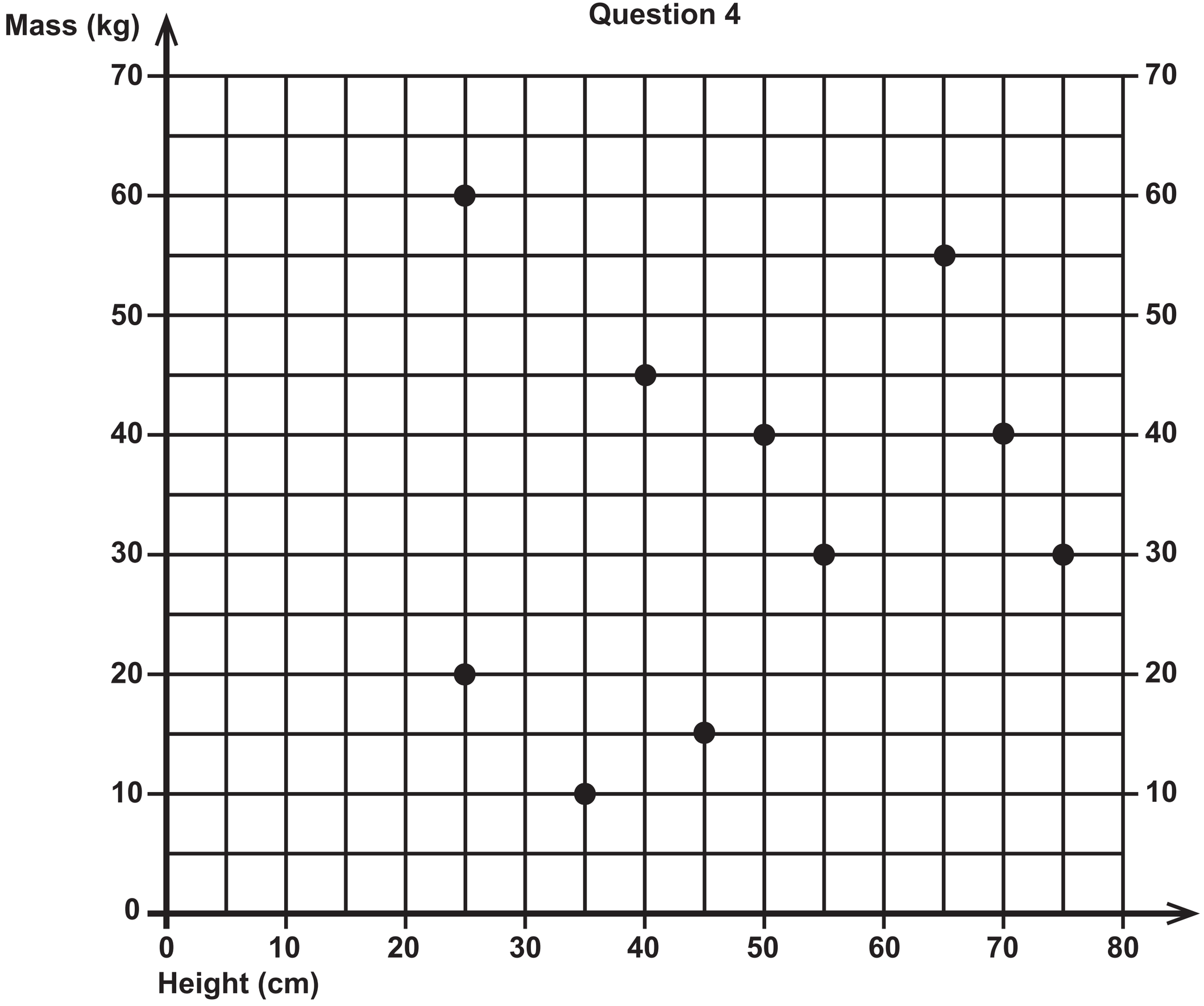
- **every 12 minutes from 8 a.m. until 12 noon**
- **every 24 minutes from 12 noon until 10 p.m.**

Question 3


HADON'S GYM
Children
Women
Men


WORKOUT PALACE
Children
Men
Women

Question 4



Question 6 (a)

Information

RECIPE TO MAKE 12 SCONES

450 g self raising flour

2 teaspoons of baking powder

75 g butter

50 g caster sugar

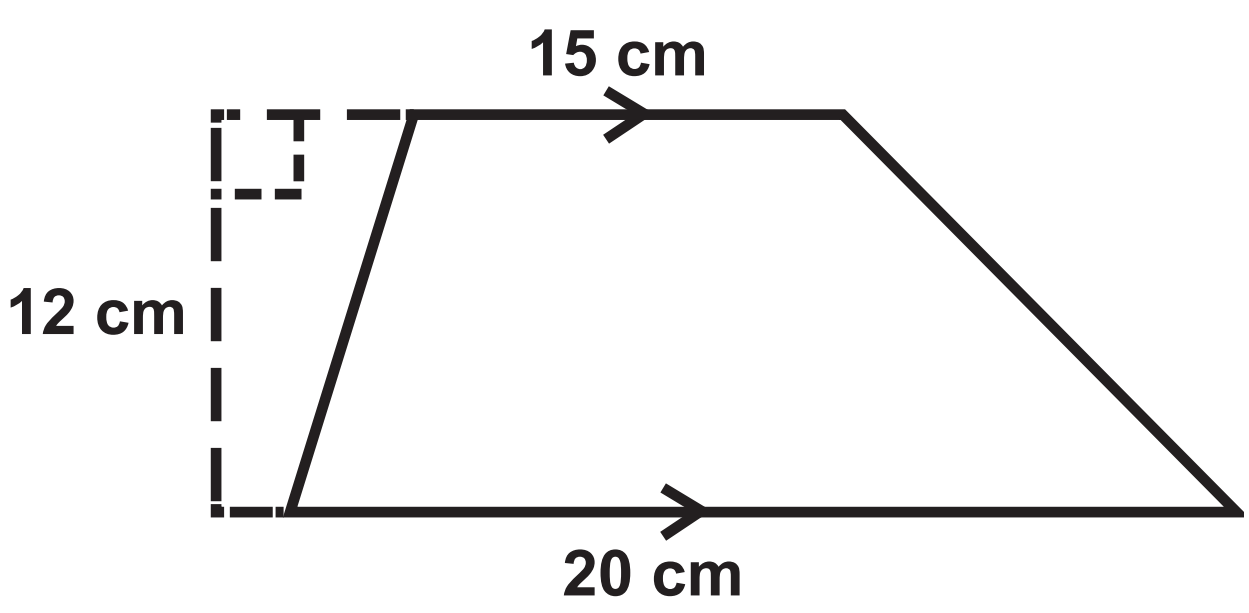
2 eggs

225 ml milk

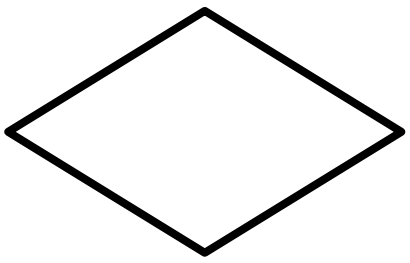
Bake at 428°F for 10 to 15 minutes

Question 6 (b)

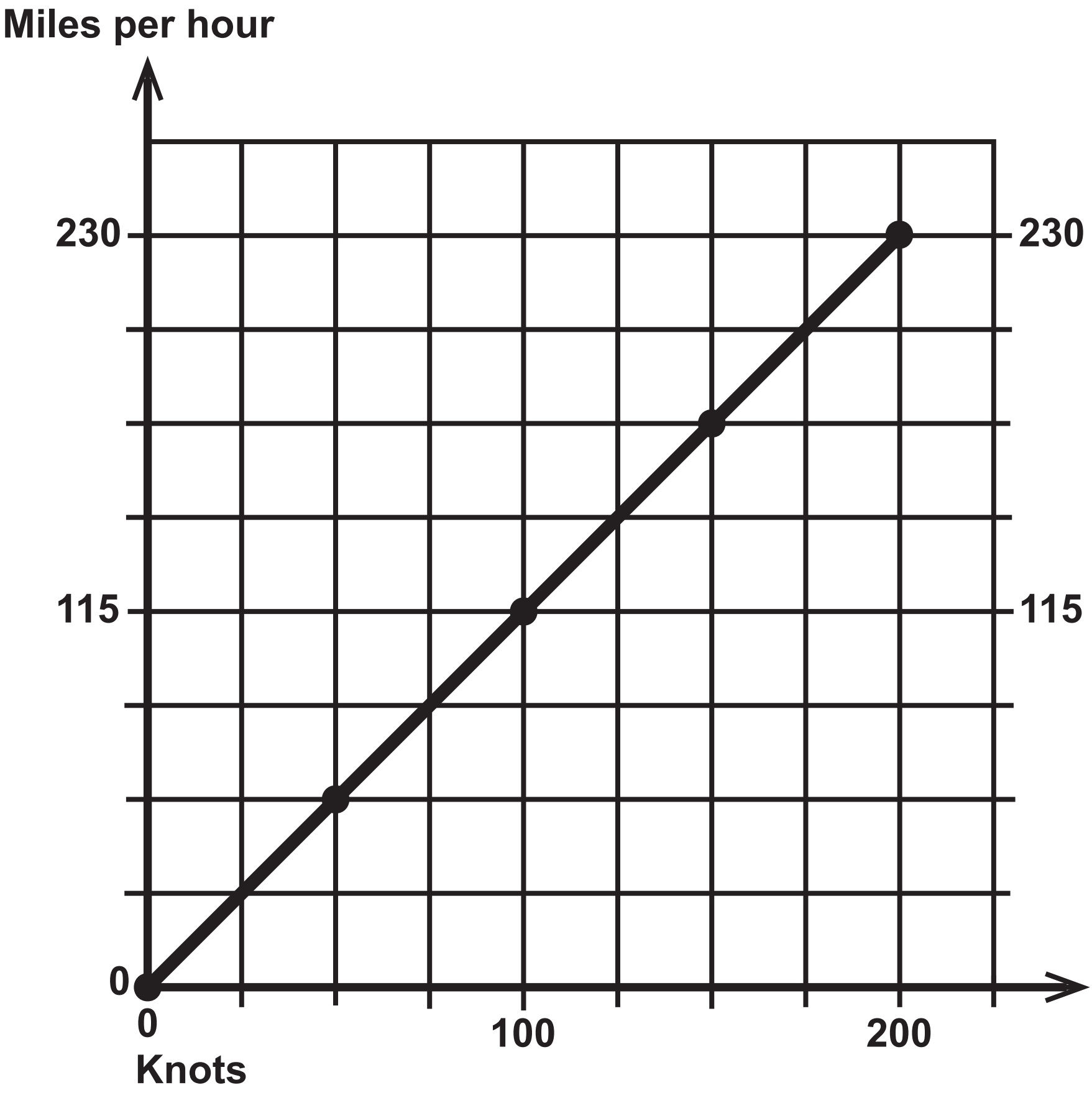
Diagram NOT drawn to scale



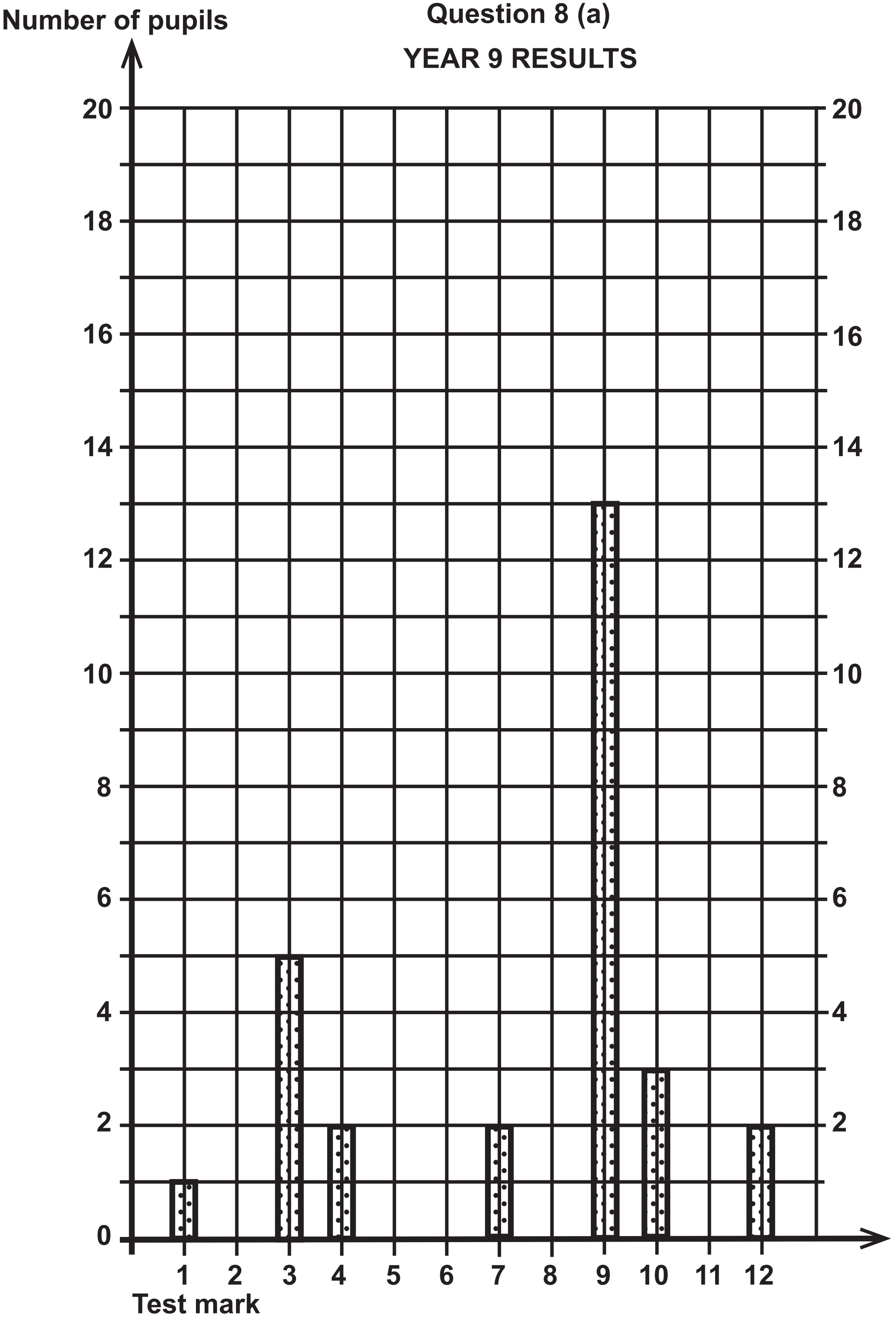
Question 6 (b) (iii)



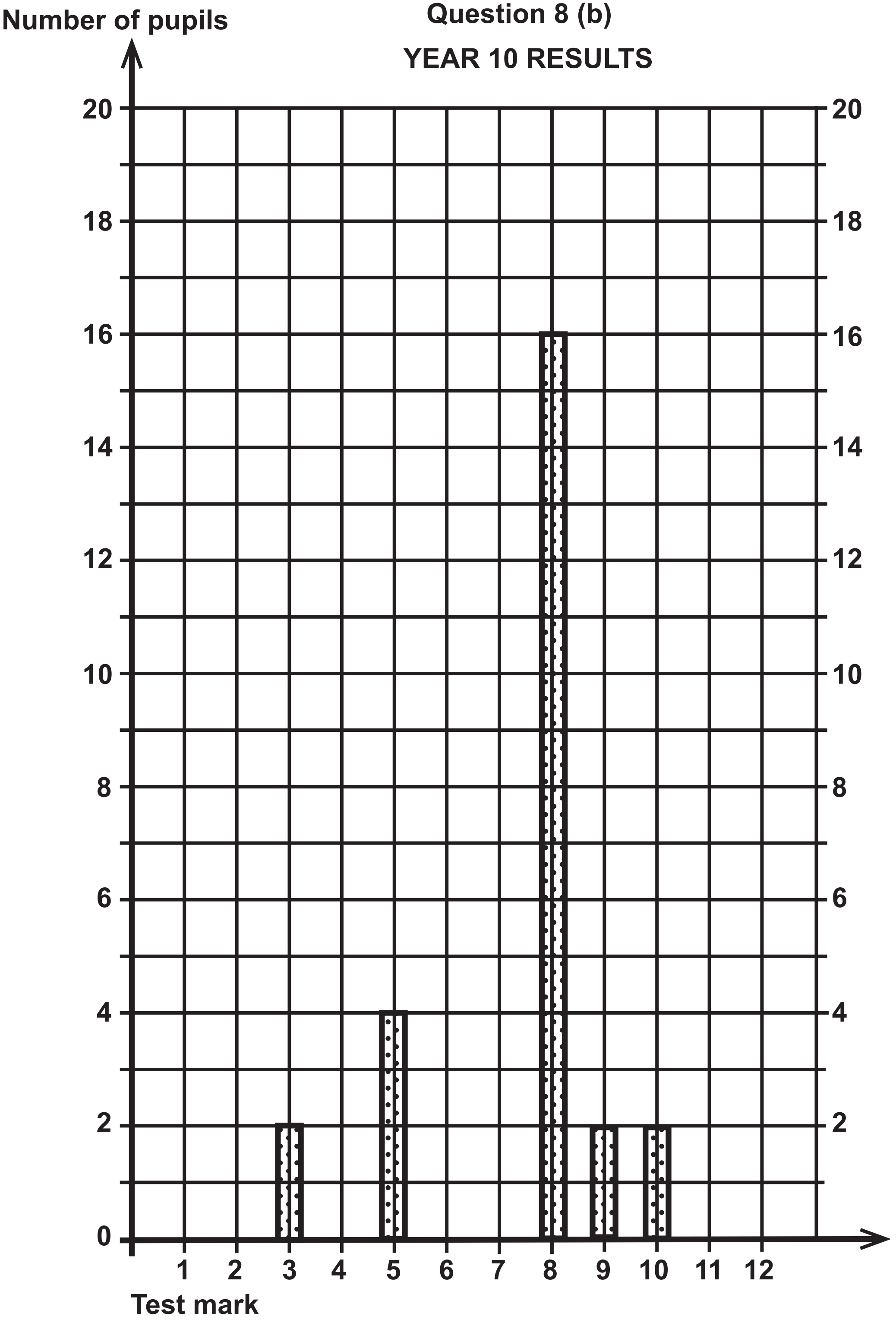
Question 7



Question 8 (a)

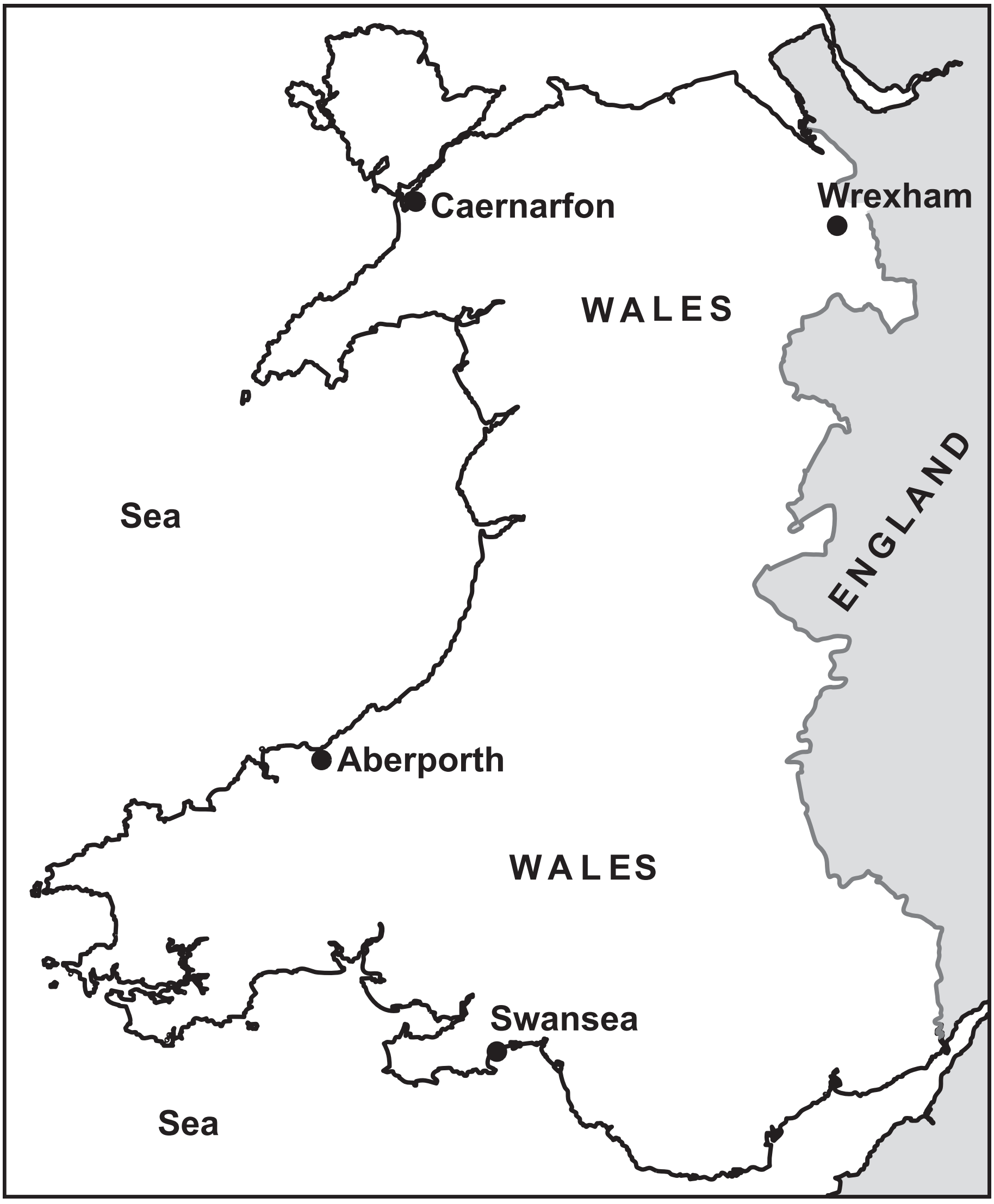

YEAR 9 RESULTS
Number of pupils
20
18
16
14
12
10
8
6
4
2
0
1
2
3
4
5
6
7
8
9
10
11
12
Test mark

Question 8 (b)


YEAR 10 RESULTS
Number of pupils
0
2
4
6
8
10
12
14
16
18
20
1
2
3
4
5
6
7
8
9
10
11
12
Test mark

Question 9

Key: 0 20
miles



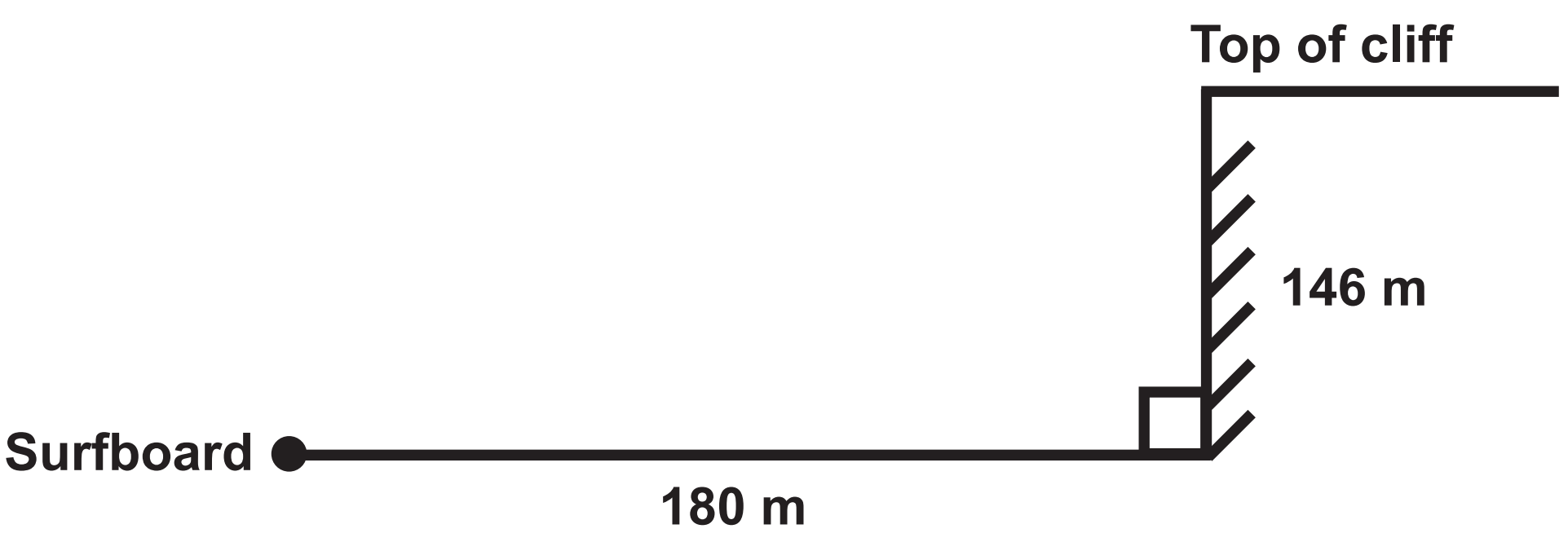
Question 9 (b)

Information

Type of vehicle	Average distance travelled per litre (km per litre)	Average distance travelled per day (km per day)
Van	8	256
Truck	5•5	704

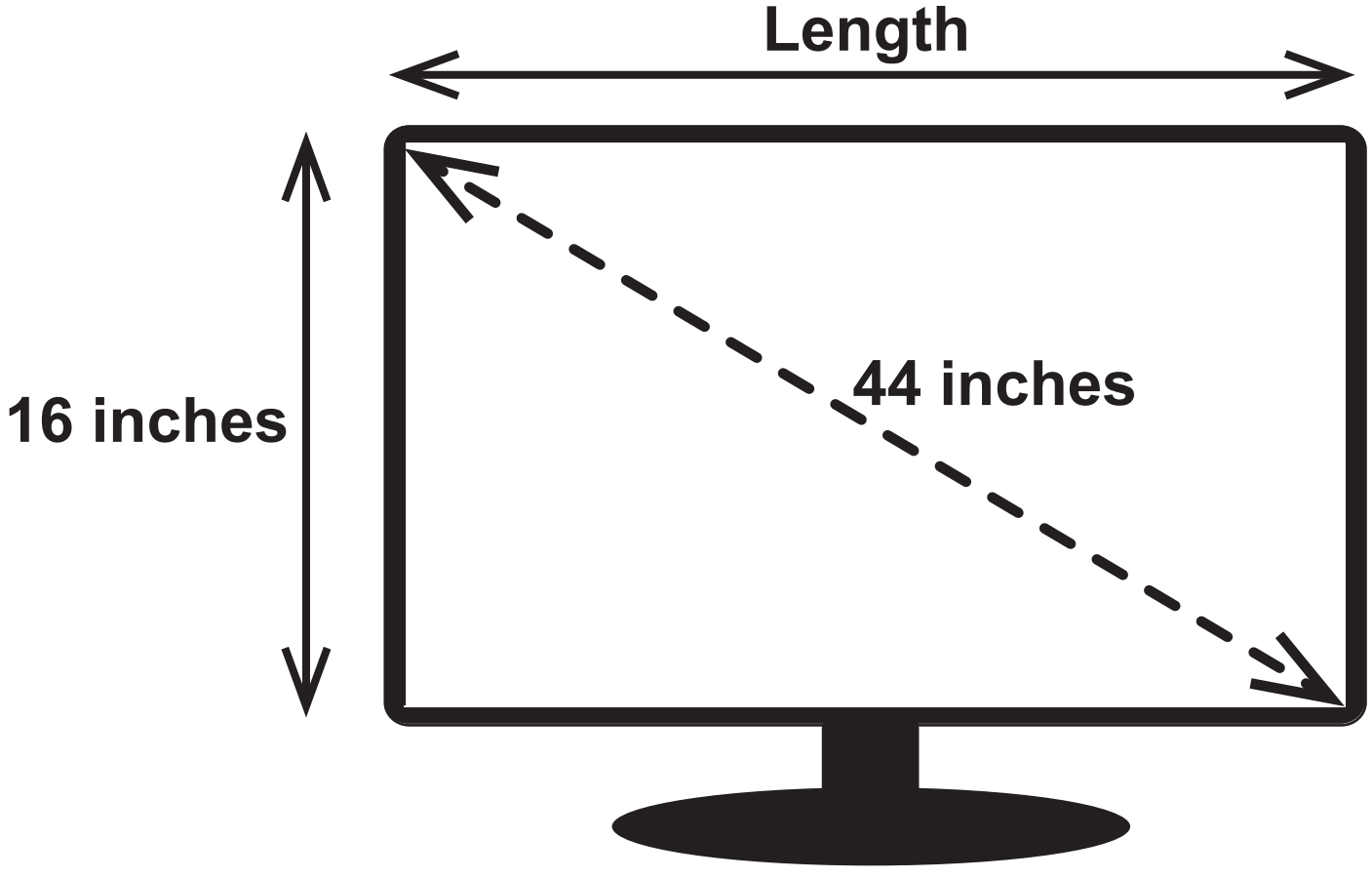
Question 12

Diagram NOT drawn to scale



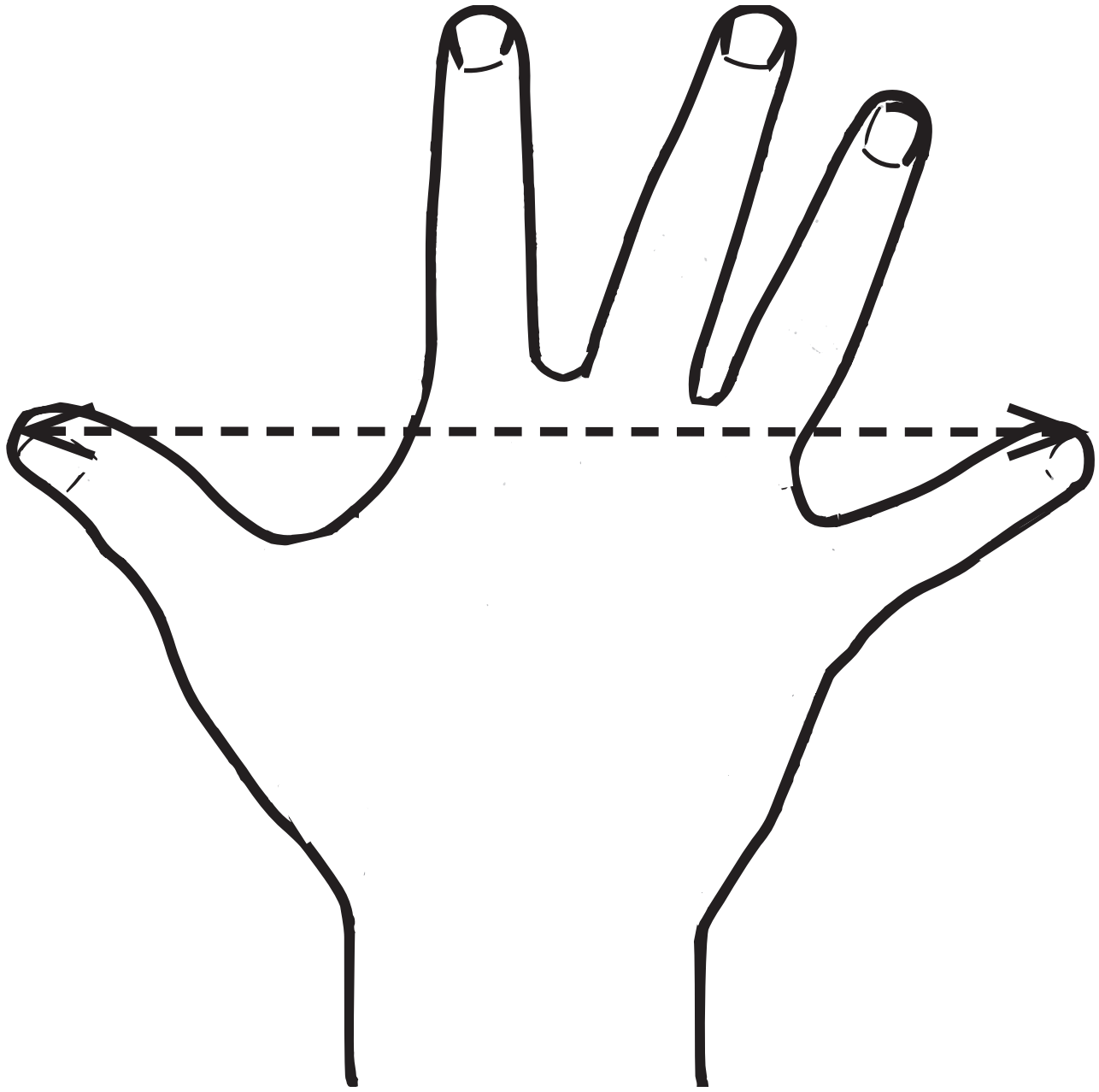
Question 13

Diagram NOT drawn to scale



Question 15

Key : <= - - - - - - => **hand span**



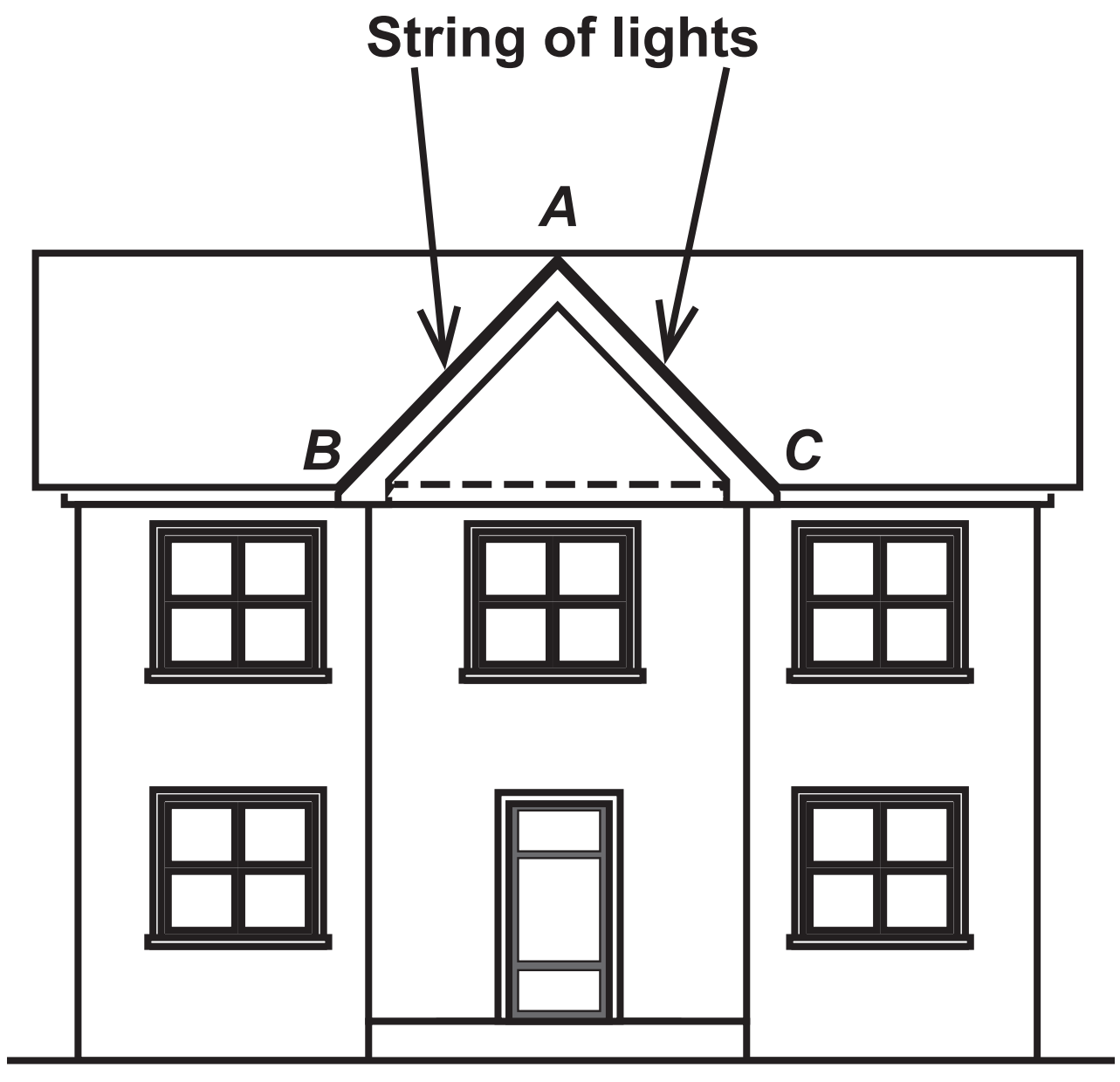
Question 15 (b)

Table

Hand span, to the nearest mm	Frequency
20•0 cm to 20•8 cm	2
20•9 cm to 21•7 cm	3
21•8 cm to 22•6 cm	10
22•7 cm to 23•5 cm	5

Question 16

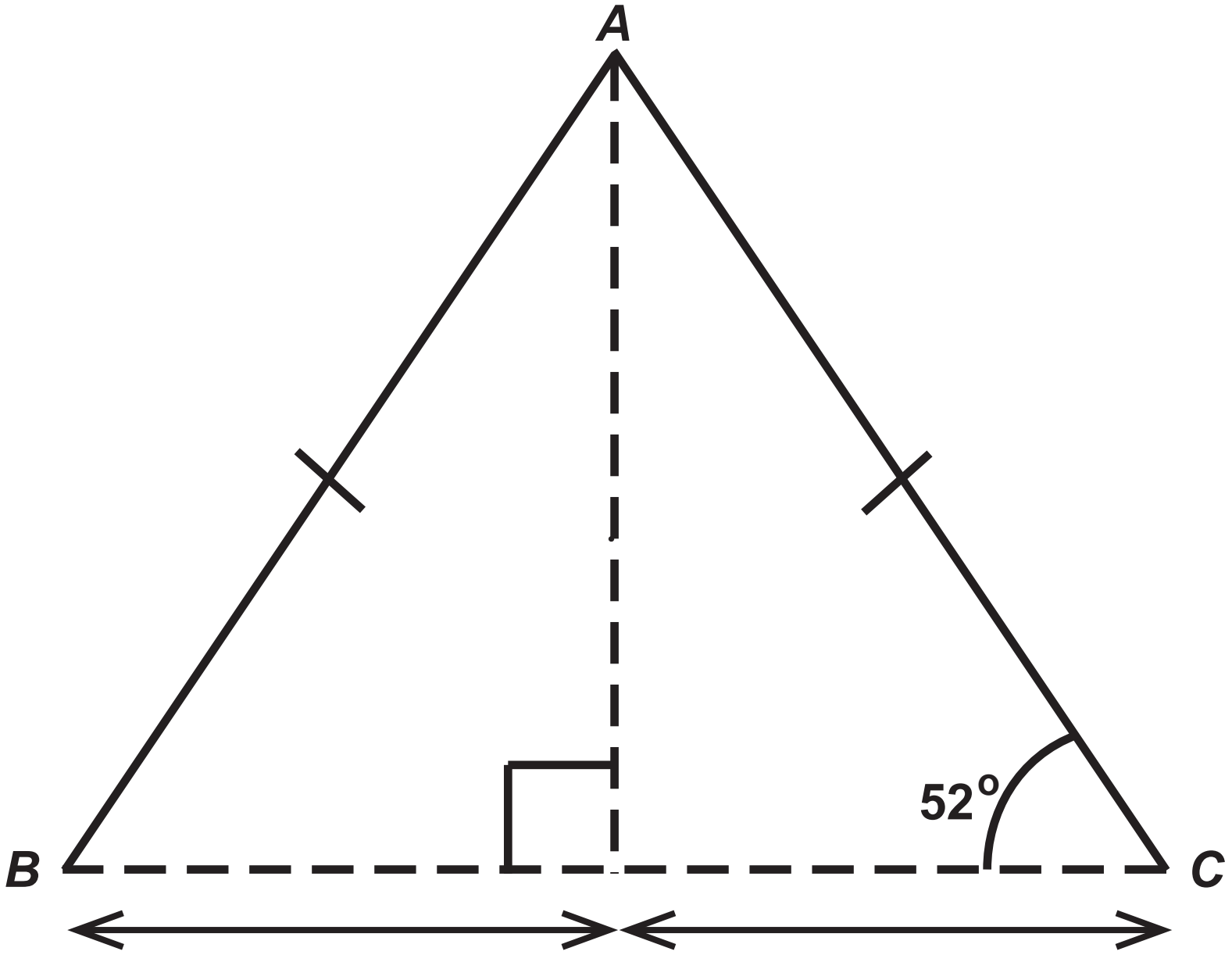
Diagram (i)



Question 16

Diagram (ii)

Diagram NOT drawn to scale



GCSE – NEW

3310U40-1

MATHEMATICS – NUMERACY

UNIT 2: CALCULATOR – ALLOWED

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Spare Diagram Booklet

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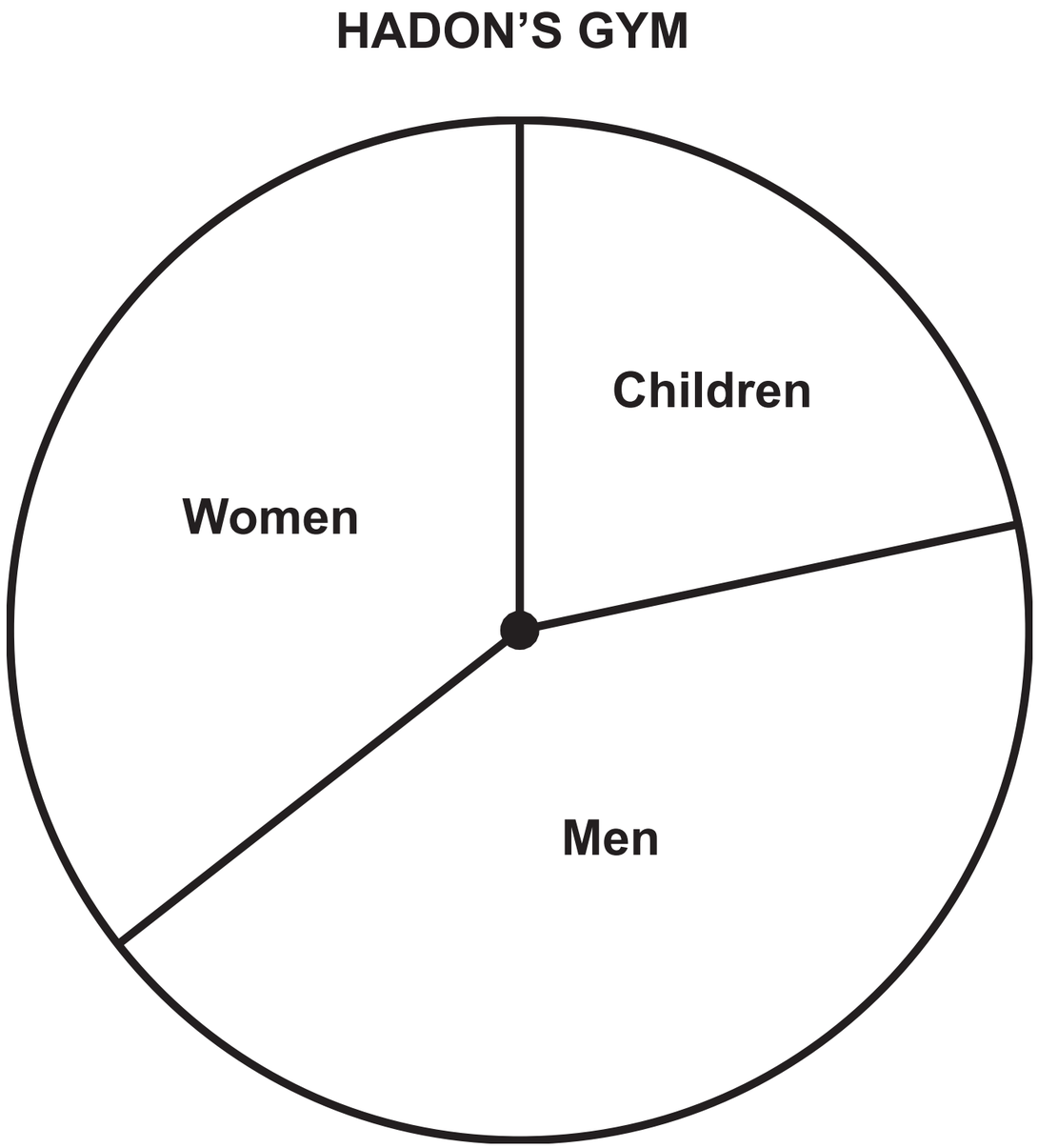
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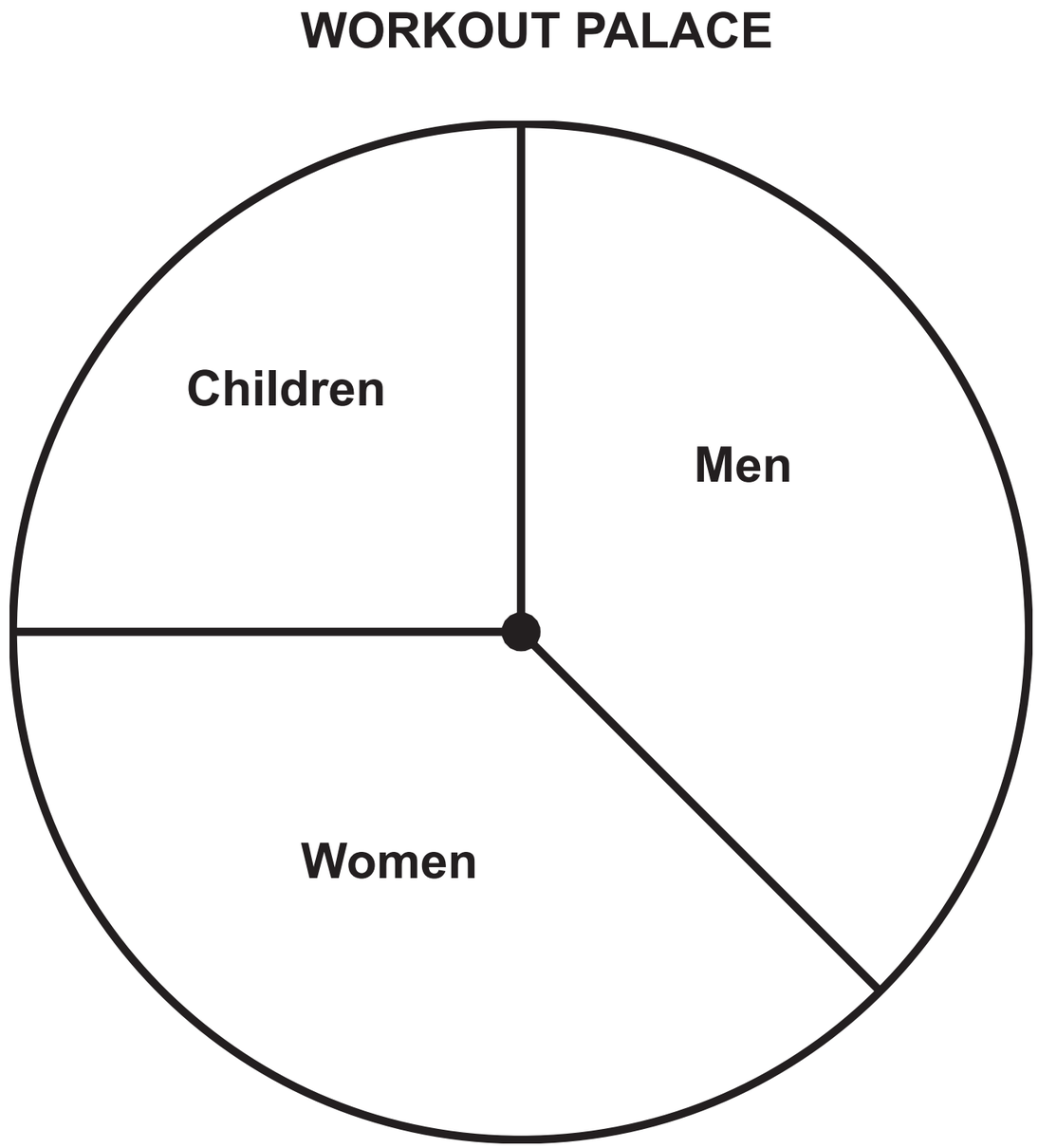
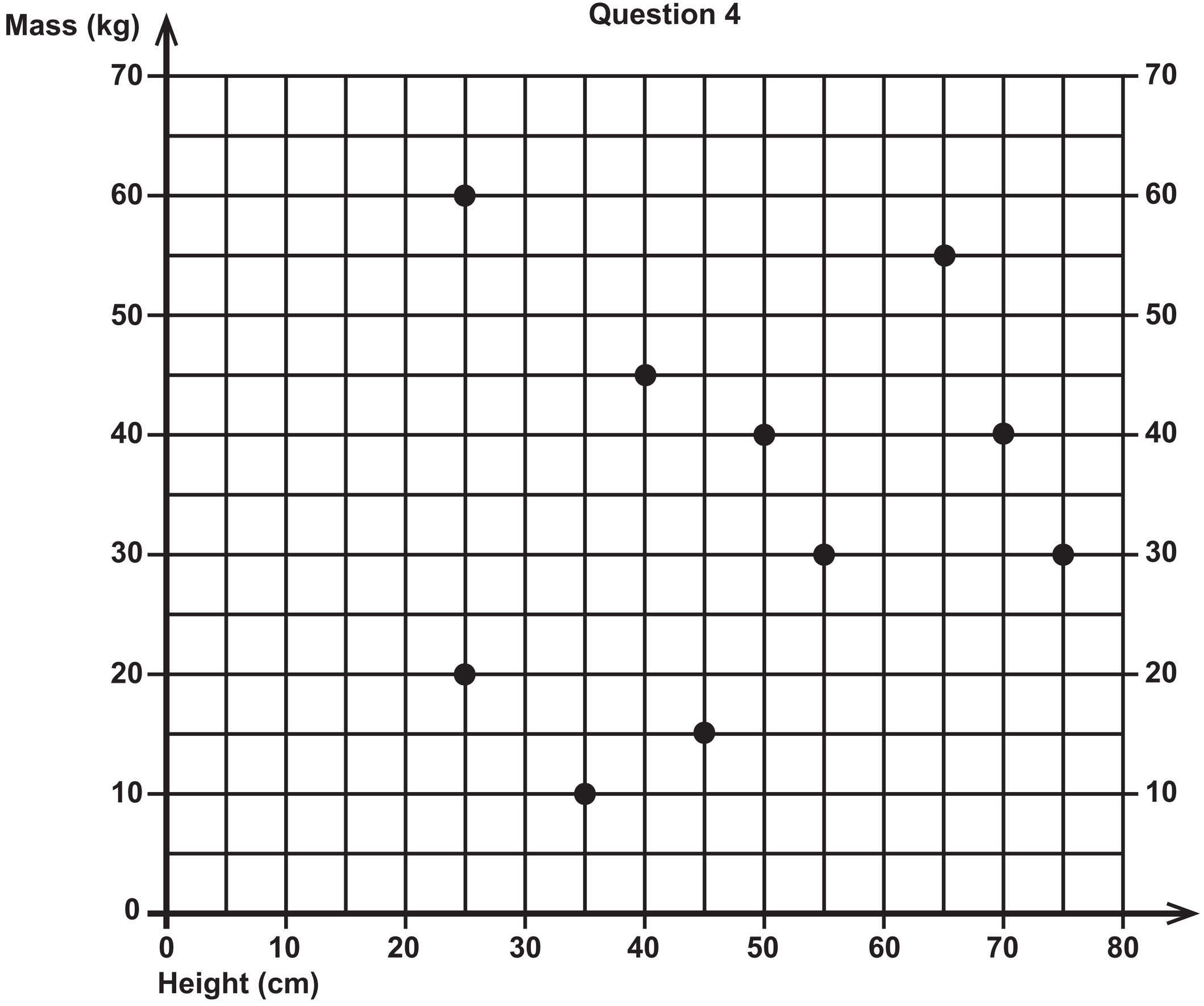
Children
Women
Men


WORKOUT PALACE
Children
Men
Women

Question 4



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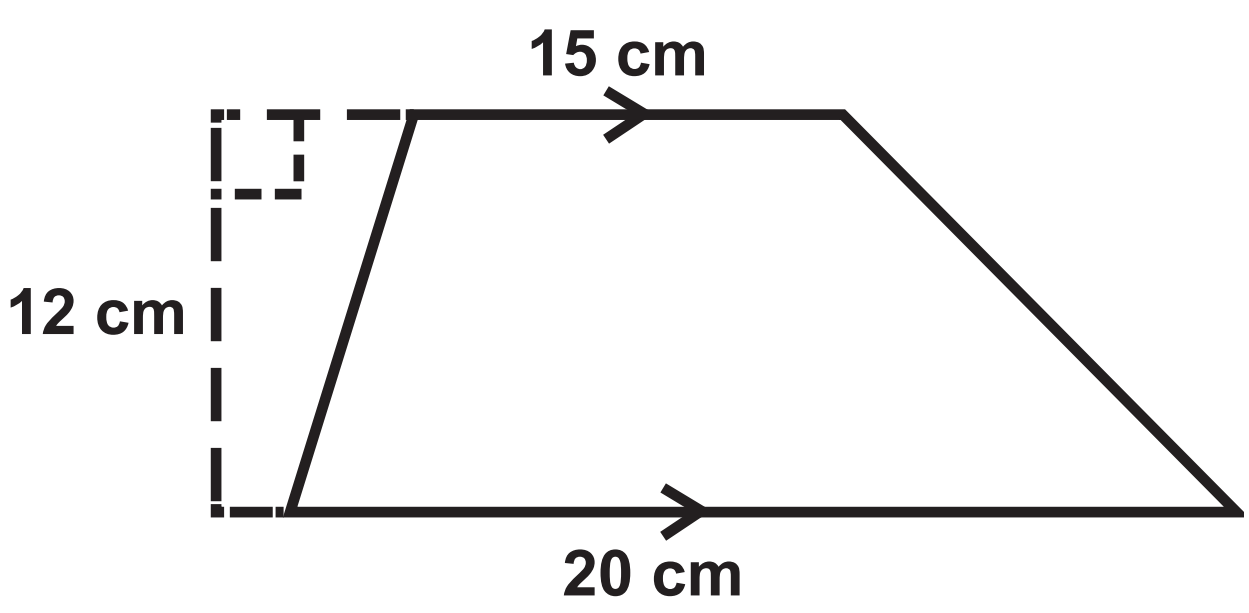
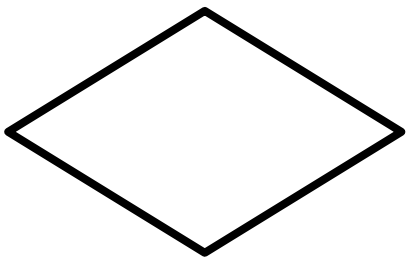
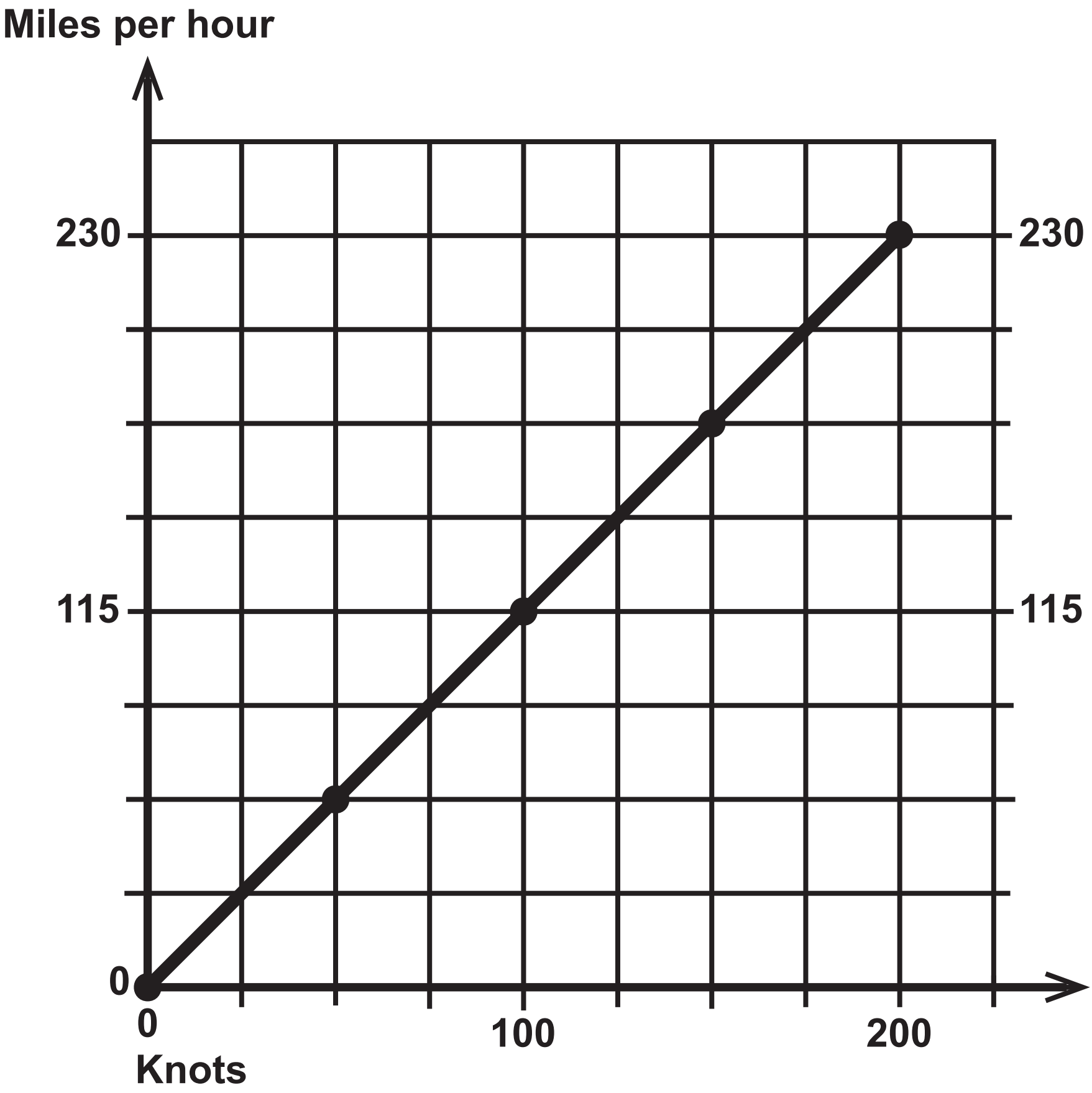


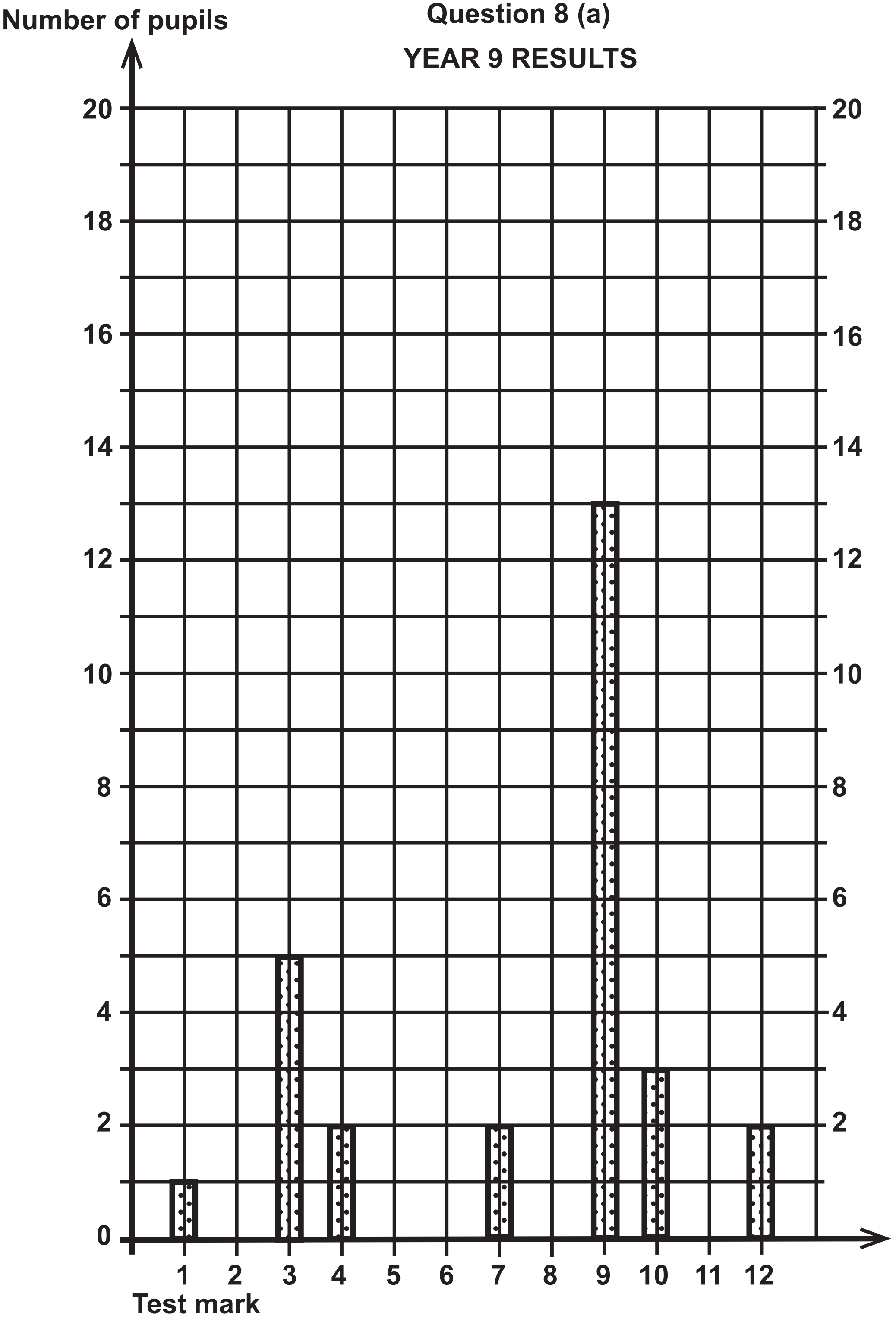
Question 6 (b) (iii)



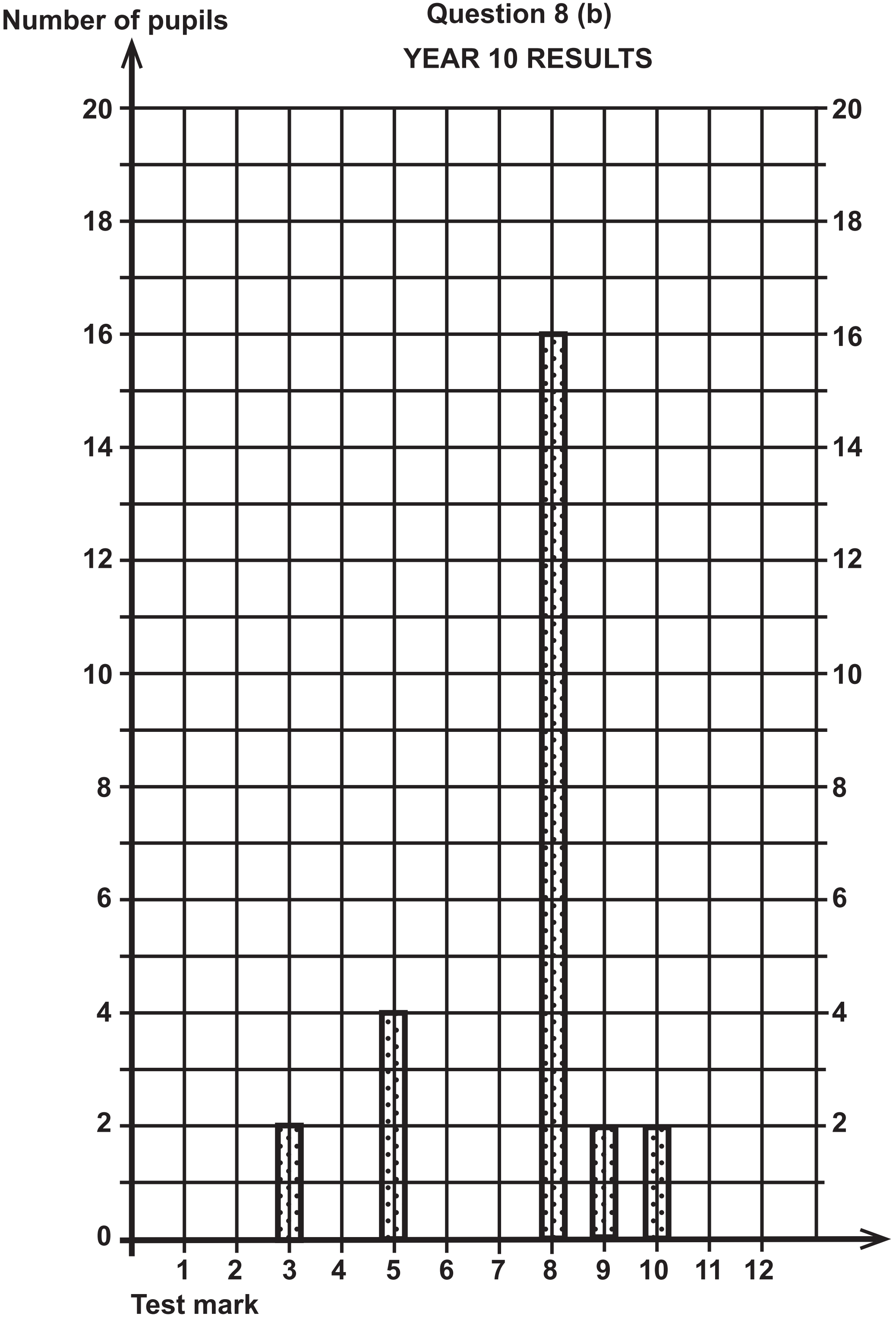
Question 7



Question 8 (a)

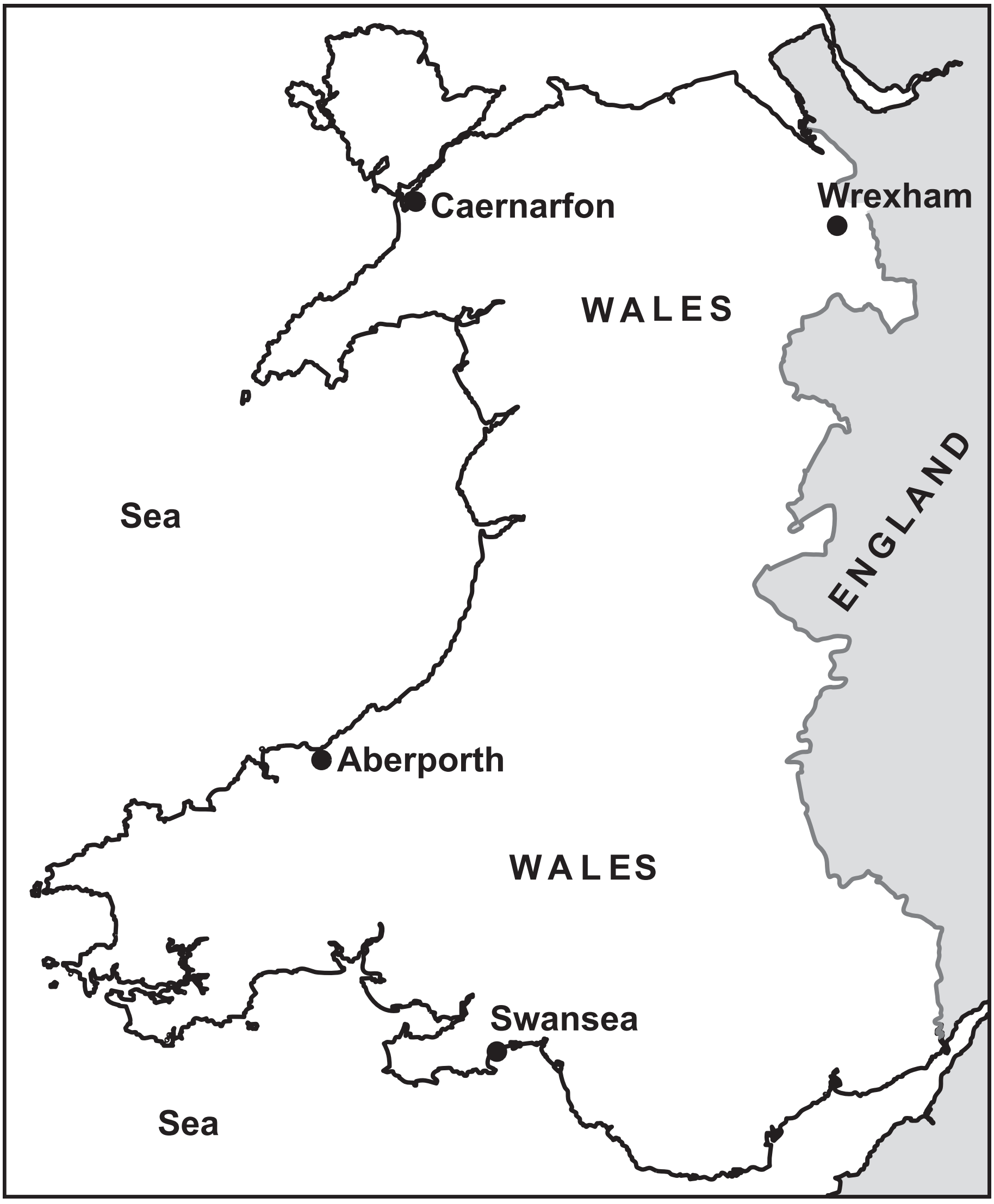

YEAR 9 RESULTS
Number of pupils
20
18
16
14
12
10
8
6
4
2
0
1
2
3
4
5
6
7
8
9
10
11
12
Test mark

Question 8 (b)


YEAR 10 RESULTS
Number of pupils
0
2
4
6
8
10
12
14
16
18
20
1
2
3
4
5
6
7
8
9
10
11
12
Test mark

Question 9

Key: 0 20
miles



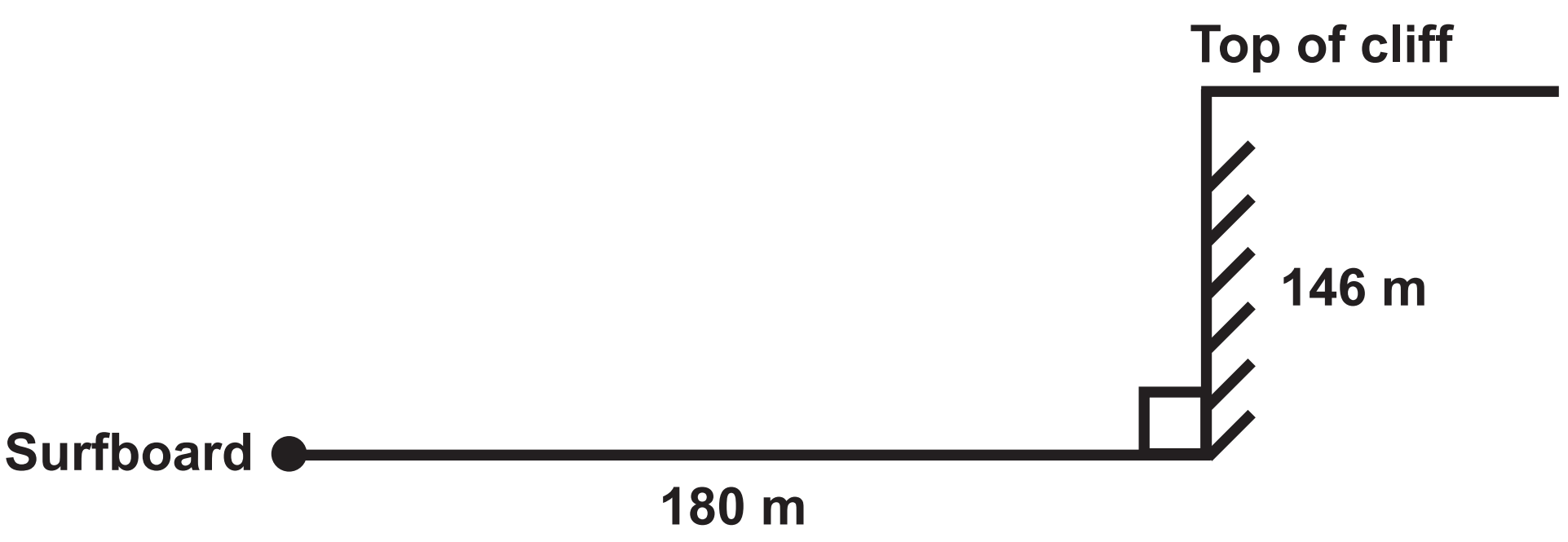
Question 9 (b)

Information

Type of vehicle	Average distance travelled per litre (km per litre)	Average distance travelled per day (km per day)
Van	8	256
Truck	5•5	704

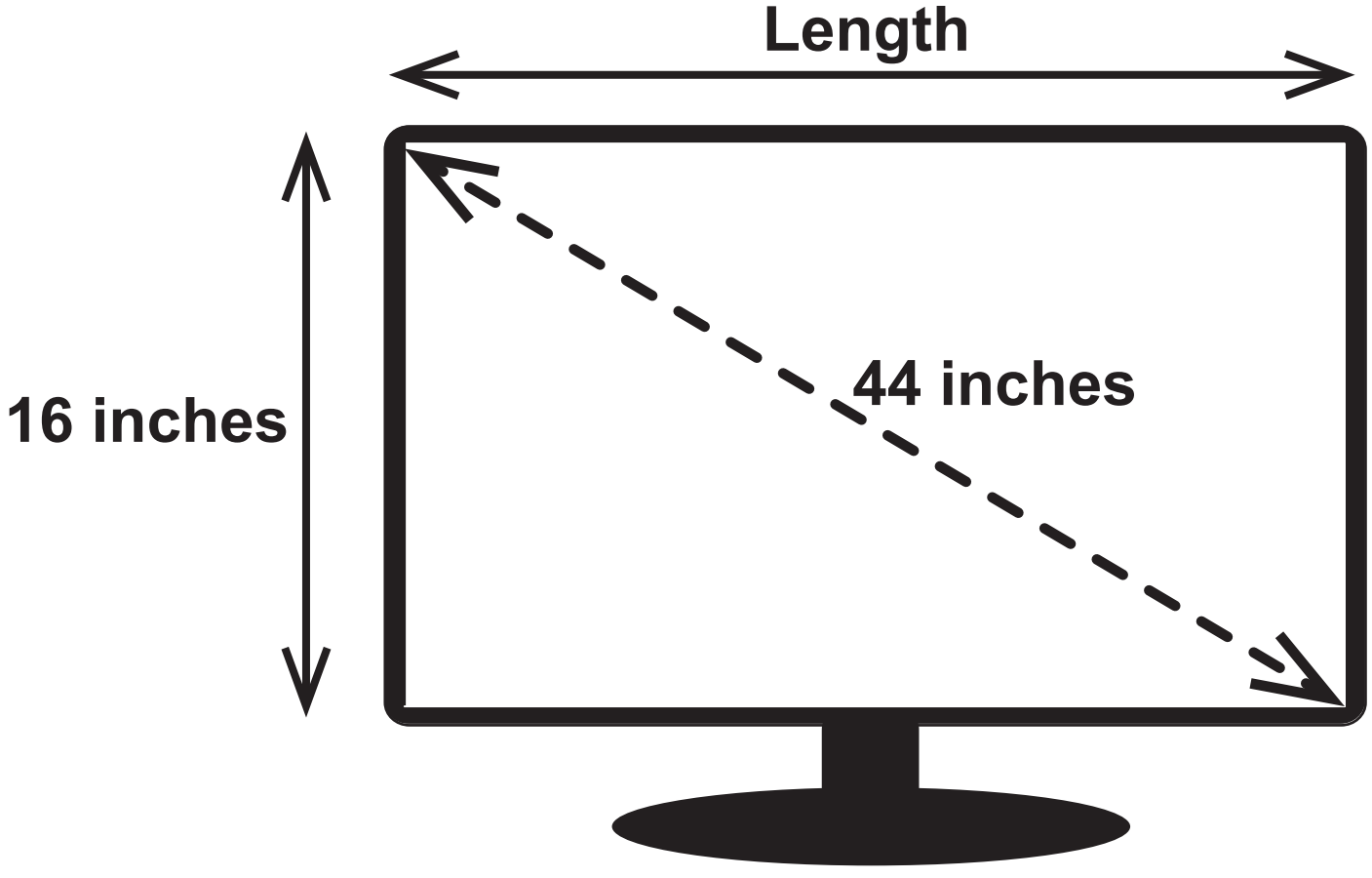
Question 12

Diagram NOT drawn to scale



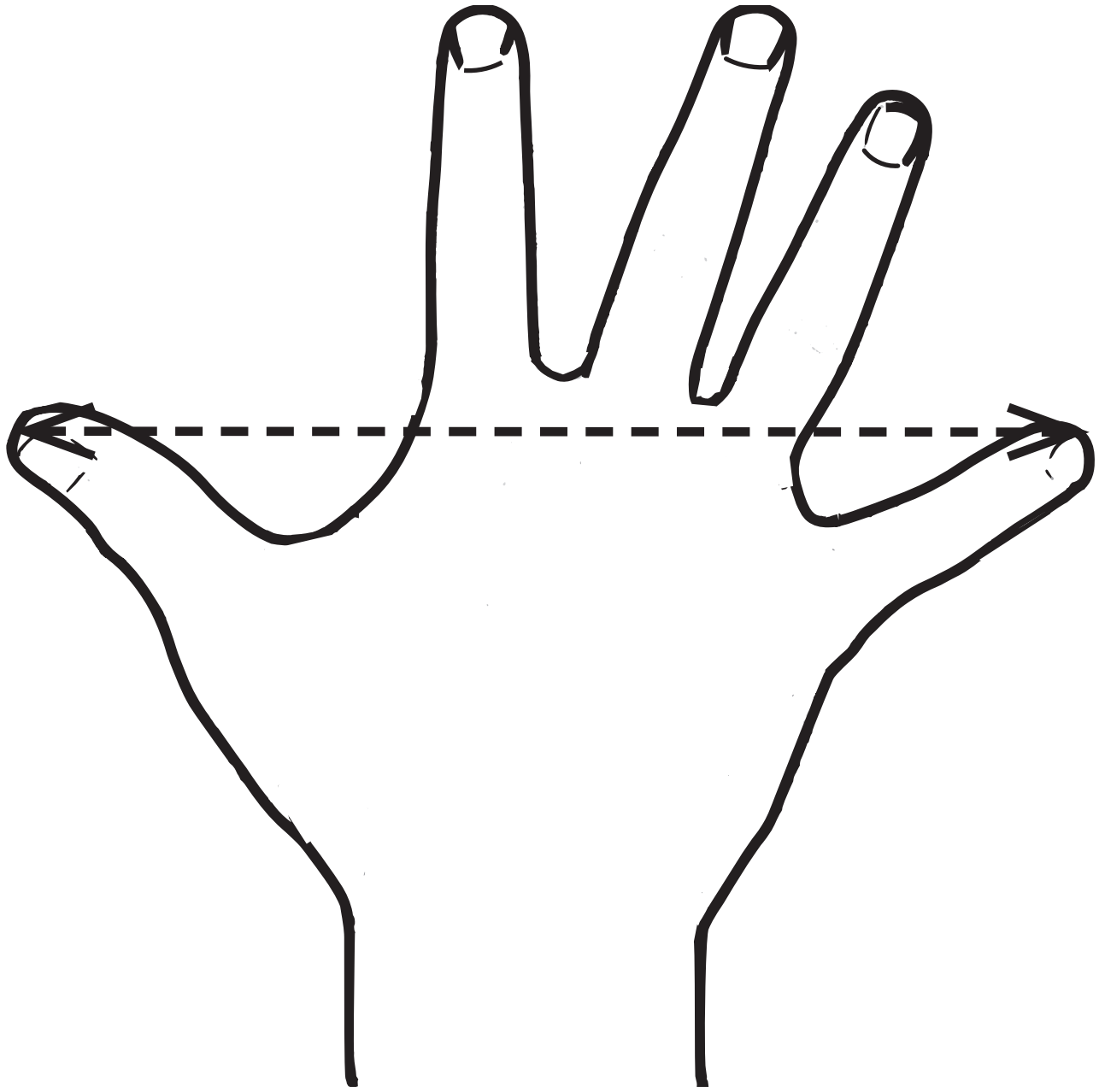
Question 13

Diagram NOT drawn to scale



Question 15

Key : <= - - - - - - => **hand span**



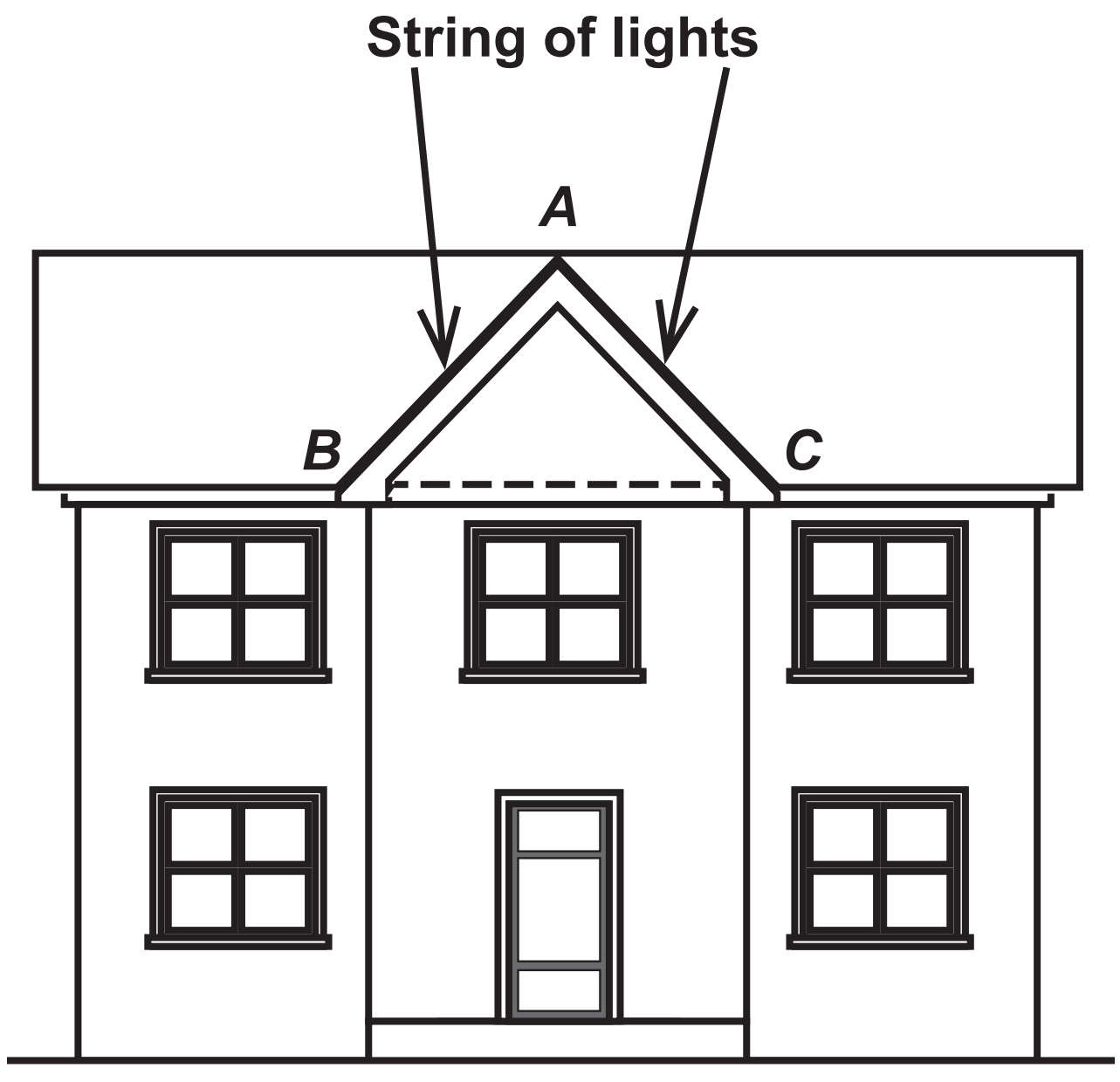
Question 15 (b)

Table

Hand span, to the nearest mm	Frequency
20•0 cm to 20•8 cm	2
20•9 cm to 21•7 cm	3
21•8 cm to 22•6 cm	10
22•7 cm to 23•5 cm	5

Question 16

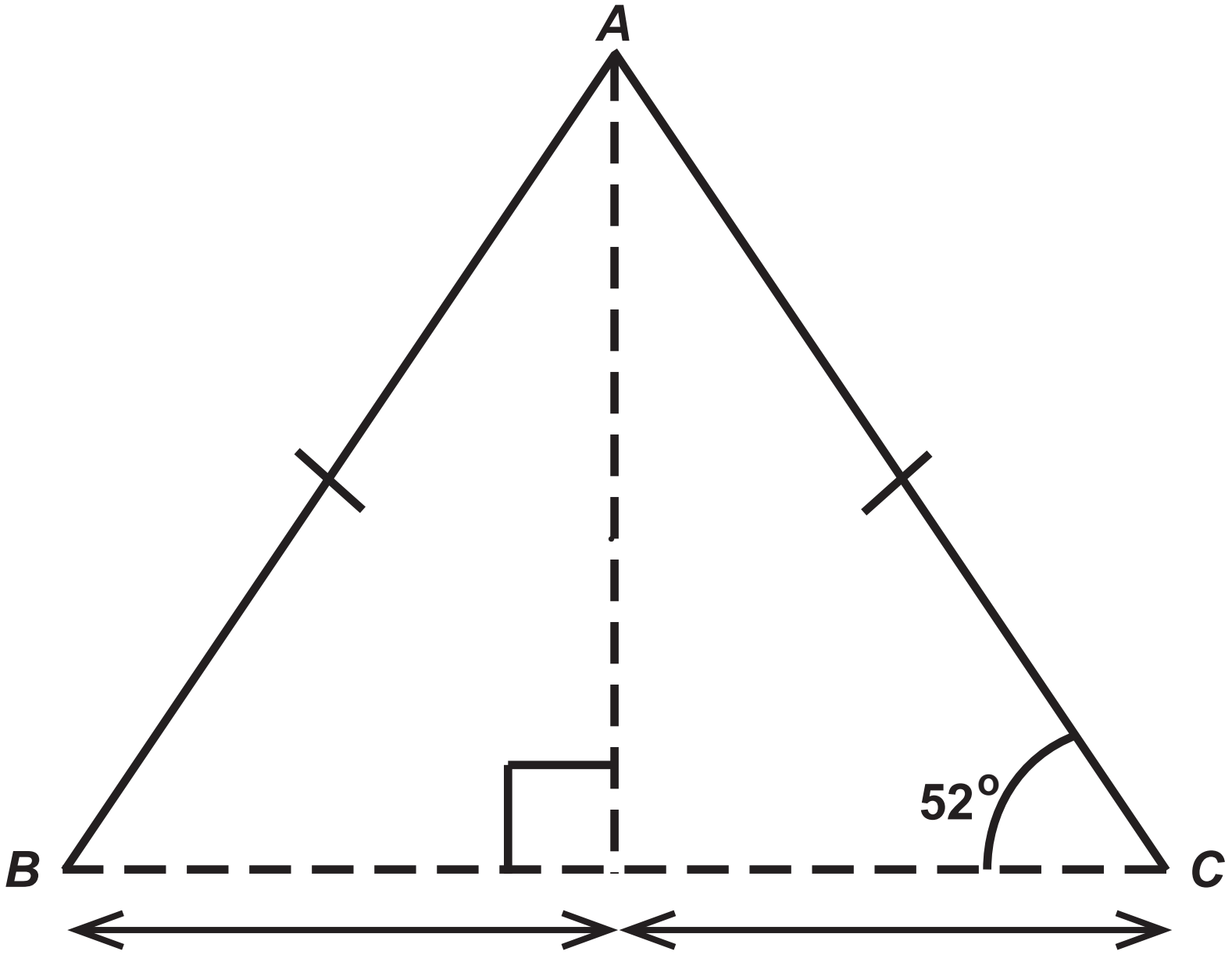
Diagram (i)



Question 16

Diagram (ii)

Diagram NOT drawn to scale



GCSE – NEW

MATHEMATICS

and

NUMERACY

FORMULA LIST

INTERMEDIATE TIER

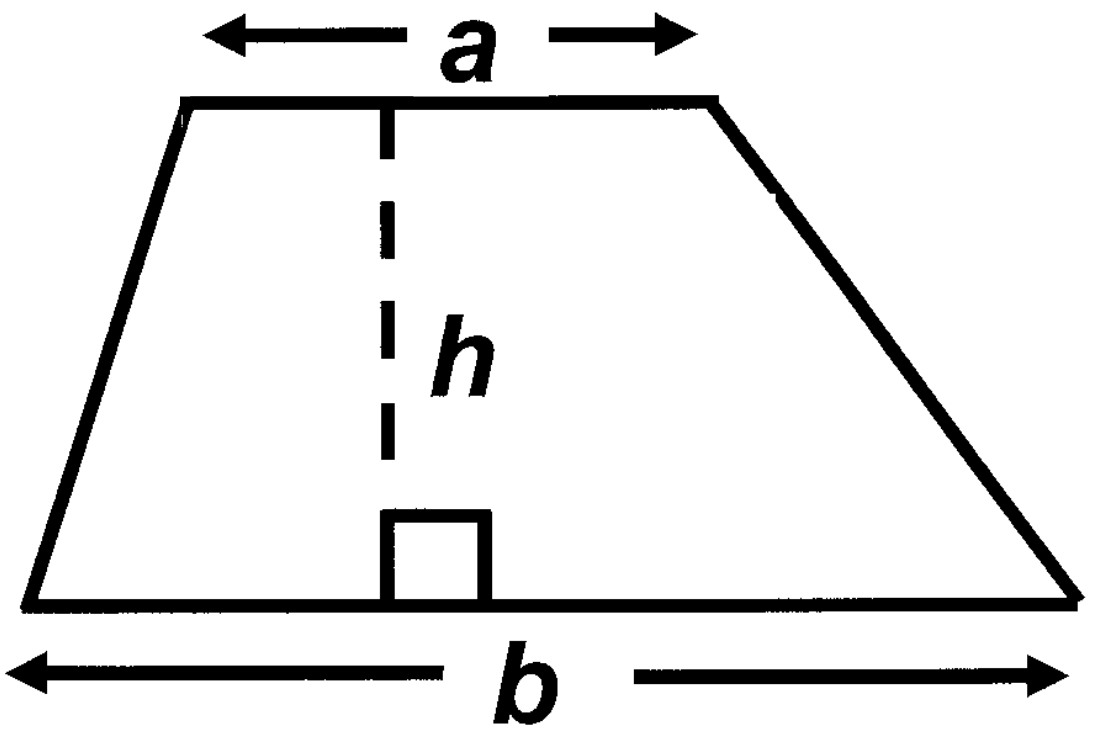
GCSE

You must not write on these formula pages.

Anything you write on these formula pages will gain NO credit.

Formula List – Intermediate Tier

Area of trapezium $= \frac{1}{2}(a + b)h$



Volume of prism =

area of cross – section × length