



3310U40-1

THURSDAY, 10 NOVEMBER 2022 – MORNING

MATHEMATICS – NUMERACY

UNIT 2: CALCULATOR – ALLOWED

INTERMEDIATE TIER

1 hour 45 minutes plus your additional time allowance

**A CALCULATOR WILL BE REQUIRED
FOR THIS EXAMINATION**

Surname: _____

First name(s): _____

Centre Number: _____

Candidate Number: 0 _____

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

(Turn over)

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.

The Diagram Booklet MUST be handed in to the invigilators and sent for marking.

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 additional page(s) at the back of the booklet.

Question numbers must be given for the work written on the additional page(s).

Take π as **3.14** 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 2 (a), the assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing.

1. (a) The Royal National Lifeboat Institution (RNLI) bought a new lifeboat.

The lifeboat was funded as follows:

- 2% from government sources
- 94% from donations
- 4% from other sources.

The new lifeboat cost £2.2 million.

How much of the cost of this lifeboat was funded from government sources?

Write your answer in figures only.

£ _____

[3 marks]

continued on the next page . . .

(Turn over)

Question 1 continued

1. (b) Look at the diagram for Question 1 (b) in the separate Diagram Booklet.

The diagram is a pie chart.

1800 medals were awarded to RNLI crew members in recent years.

The distribution of the medals is shown accurately in the pie chart.

- (i) What fraction of the medals awarded were bronze?
Circle your answer.

$\frac{135}{360}$	$\frac{245}{360}$	$\frac{65}{360}$	$\frac{115}{360}$	$\frac{75}{360}$
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[1 mark]

continued on the next page . . .

(Turn over)

Question 1 (b) continued

- 1. (b) (ii) How many gold medals were awarded?**

You must show all your working.

[3 marks]

(Turn over)

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

Iwan recorded his gas usage for a week.

His meter reading was **21 345 kWh** at the start of the week.

His meter reading was **21 640 kWh** at the end of the week.

Gas costs **7.2p** per kWh.

VAT at **5%** is payable on the cost of any gas used.

Calculate the total cost of Iwan's gas for the week.

You must show all your working.

continued on the next page . . .

(Turn over)

Question 2 continued

- 2. (b) For the first 7 days of October, the mean daily outside temperature at midday where Iwan lives was 13.2°C . The temperatures at midday for the next 2 days of October were 12.2°C and 12.4°C .**

Calculate the total of the temperatures for the first 7 days.

Hence, calculate the mean midday temperature for the first 9 days of October.

You must show all your working.

The mean midday temperature for the first **9** days
of October was _____ °C

[4 marks]

continued on the next page . . .

(Turn over)

Question 2 continued

2. (c) Look at the diagram for Question 2 (c) in the separate Diagram Booklet.

The diagram is NOT drawn to scale.

The plan of the streets where Iwan lives is shown.

On the diagram, the angles of 42° , 75° , 82° , w , x and y are shown.

Find the size of each of the angles w , x and y .

$w =$ _____ $^\circ$

$x =$ _____ $^\circ$

$y =$ _____ $^\circ$

[3 marks]

(Turn over)

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

The frequency diagrams show the lengths of time that men and women spent training in the gym on Friday.

- (a) Freddie says he spent exactly 1 hour 25 minutes training in the gym on Friday.**

Explain how you know that Freddie is not telling the truth.

[1 mark]

continued on the next page . . .

(Turn over)

Question 3 continued

3. (b) How many men spent less than
20 minutes training in the gym on Friday?
Circle your answer.

12	14	54	6	20
----	----	----	---	----

[1 mark]

- (c) How many women spent less than
40 minutes training in the gym on Friday?
Circle your answer.

14	26	34	38	76
----	----	----	----	----

[1 mark]

continued on the next page . . .

(Turn over)

Question 3 continued

3. (d) Gwen says,

“A greater PROPORTION of women than men spent between 40 and 60 minutes training in the gym on Friday.”

Is Gwen’s statement true or false?

True ☐ **False** ☐

You must show all your working to support your answer.

(Turn over)

[5 marks]

4. Lena flew from Havana Airport in Cuba to Gatwick Airport in the UK.
She then drove home from Gatwick Airport.

(a) When it is **09:40** in Havana, it is
14:40 on the same day in Gatwick.

It took **9** hours **15** minutes to fly from
Havana to Gatwick.

Lena's flight left Havana on Monday
at **17:40** local Havana time.

On what day and at what time did this
flight arrive in Gatwick?

Give your answer in UK time.

Day _____

Time _____

[4 marks]

continued on the next page . . .

(Turn over)

Question 4 continued

4. (b) Lena lives 80 miles from Gatwick Airport.

The first 20 miles of Lena's journey home from the airport took 1 hour.

The average speed for the remaining 60 miles of her journey was 40 mph.

(i) Calculate the time taken for the remaining part of her journey.

[2 marks]

continued on the next page . . .

(Turn over)

Question 4 (b) continued

- 4. (b) (ii) Calculate the average speed, in mph, of Lena's 80 – mile journey home from the airport.**

Average speed _____ mph

[3 marks]

(Turn over)

5. (a) Last year, Viktor's total income before tax was **28 000** euros.

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

The table shows the tax bands, taxable income and tax rates for last year.

Viktor has already paid **3600** euros towards his income tax bill for last year. Calculate how much income tax Viktor still owes.

You must show all your working.

[7 marks]

continued on the next page . . .

(Turn over)

Question 5 continued

5. (b) When Viktor paid **3600** euros towards his bill, the exchange rate was **£1 = 1.11** euros.

How much was **3600** euros in pounds?

Give your answer correct to the nearest penny.

£ _____

[2 marks]

(Turn over)

6. Delyth and Ronnie are both students at the local college.

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

The diagram is NOT drawn to scale.

Their houses and the college are all joined by straight roads, as shown in the diagram.

Delyth usually walks directly to college. Calculate how much further Delyth has to walk if she passes Ronnie's house on her way to college.

[5 marks]

continued on the next page . . .

(Turn over)

Question 6 continued

- 6. (b) Look at the table for Question 6 (b) in the separate Diagram Booklet.**

35 students were asked how far they travelled to the college.

The results are recorded in the table.

continued on the next page . . .

Question 6 (b) continued

6. (b) (i) Ronnie is one of these **35** students.
He walks **200 m** directly to college.

Does Ronnie travel further than the
median distance travelled by these
35 students?

Yes

☐

No

☐

Can't tell

☐

You must give a reason for your
answer.

[1 mark]

continued on the next page . . .

(Turn over)

Question 6 (b) continued

6. (b) (ii) Calculate an estimate of the mean distance these **35** students travelled to the college.

[illegible]

Estimate of the mean distance travelled by these 35 students is _____ m

[4 marks]

(Turn over)

Question 6 continued

- 6. (c) There are 140 students who travel by bus to and from college.**

Delyth wants to find out why these students do not walk to college.

She has decided to use a systematic sampling method to select 7 of these students to form a discussion group.

The names of all the 140 students are in a list.

Delyth has randomly selected the 2nd student in the list to join the discussion group.

Complete the table on the next page to give the positions in the list of the 7 students selected to join the discussion group.

Student	Position in the list
1	2nd
2	
3	
4	
5	
6	
7	

[2 marks]

(Turn over)

7. (a) **10 years ago, Matteo bought a car for £4500**

His car depreciated in value by 20% in the FIRST year.

In each of the following years, his car depreciated by 14% of its previous year's value.

Show that the value of Matteo's car is now less than £950

You must show all your working.

[3 marks]

continued on the next page . . .

(Turn over)

Question 7 continued

7. (b) Matteo's car insurance has increased by **25%** from the amount he paid last year.

His car insurance is **£750** this year.

Calculate the amount Matteo paid for his car insurance last year.

Matteo paid £ _____ for his car insurance last year.

[2 marks]

(Turn over)

Question 7 continued

7. (c) Look at the diagram for Question 7 (c) in the separate Diagram Booklet.
The diagram is NOT drawn to scale.

The diagram shows the front of Matteo's garage, labelled ***ABCDE***.

In the diagram,
the total height of the garage is **320 cm**

$$AB = BC$$

$$CD = 240 \text{ cm}$$

$$\text{Angle } BCA = 33^\circ$$

Calculate the width of Matteo's garage.

continued on the next page . . .

(Turn over)

Question 7 continued

7. (d) Look at the diagram for Question 7 (d)

in the separate Diagram Booklet.

The diagram is NOT drawn to scale.

The diagram shows a plan view of

Matteo's car inside his garage.

The length of Matteo's car is 400 cm,

correct to the NEAREST 10 cm.

The length of his garage is 550 cm,

correct to the NEAREST 10 cm.

When Matteo parks his car, he leaves

exactly 70 cm between the car and the

back wall of the garage.

Calculate the maximum length of the

space between Matteo's car and the

garage door.

[3 marks]

8. (a) The population of Barbados in 1644 was said to be 30 000

By 1964, the population of Barbados had increased by 682%.

From 1964 to 2014, the population of Barbados increased by a further 20%.

Calculate the population of Barbados in 2014.

You must show all your working.

[3 marks]

(Turn over)

Question 8 continued

8. (b) The area of Barbados is 432 km^2

**The population of Barbados in
September 2019 was 287 106**

**Calculate the population density
of Barbados in September 2019.**

**Give your answer correct to
2 significant figures.**

[3 marks]

continued on the next page . . .

(Turn over)

Question 8 continued

8. (c) The density of some of the sand
in Barbados is 1442 kg/m^3

Express this density in g/cm^3

[2 marks]

END OF PAPER

TOTAL 80 MARKS

(Turn over)

Question number	Additional pages, if required. Write the question number(s) in the left - hand margin.

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INTERMEDIATE TIER

**The Diagram Booklet MUST be handed in
to the invigilators and sent for marking.**

Diagram Booklet

Surname: _____

First name(s): _____

Centre Number: _____

Candidate Number: 0 _____

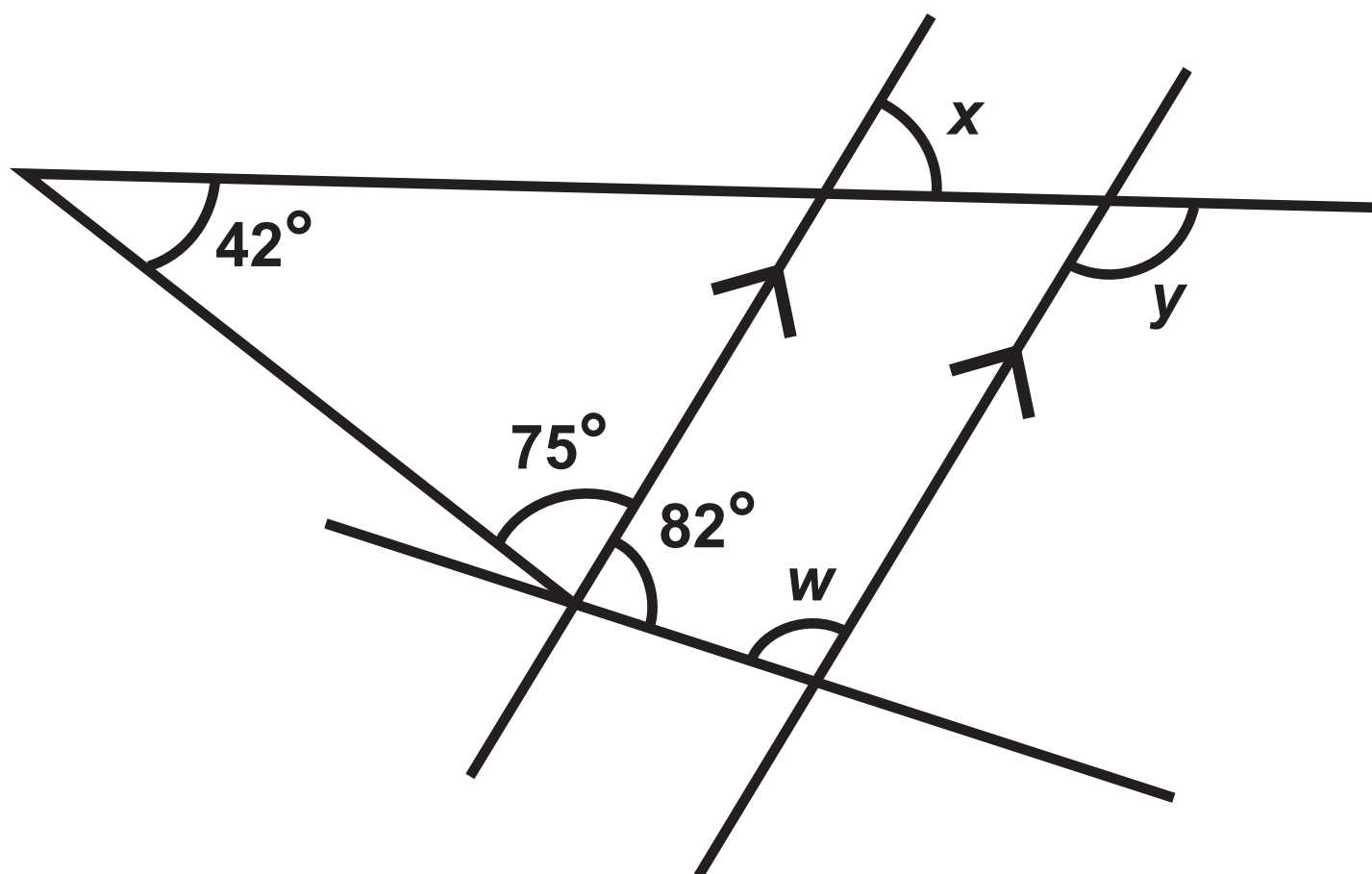
Question 1 (b)

Pie chart



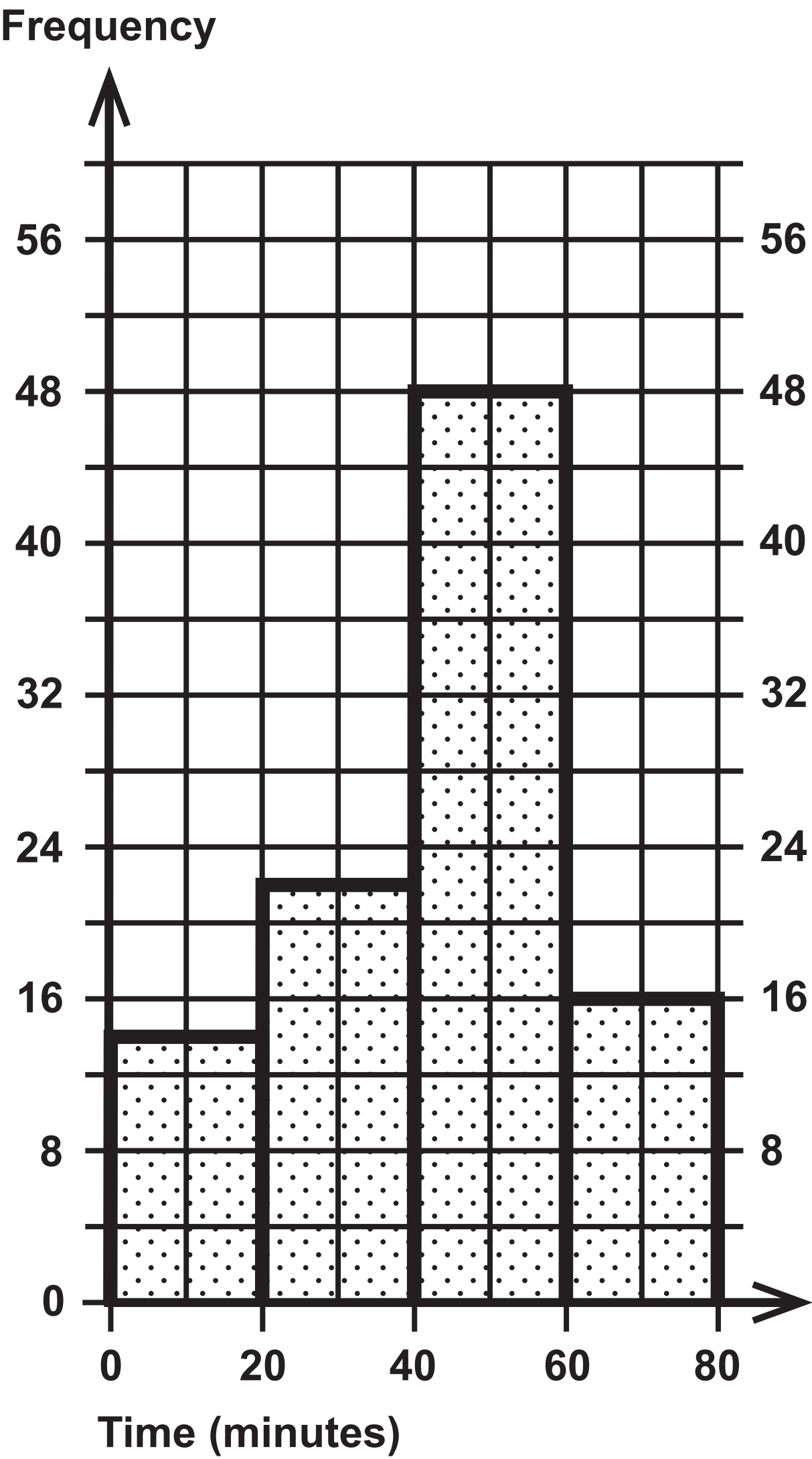
Question 2 (c)

Diagram NOT drawn to scale



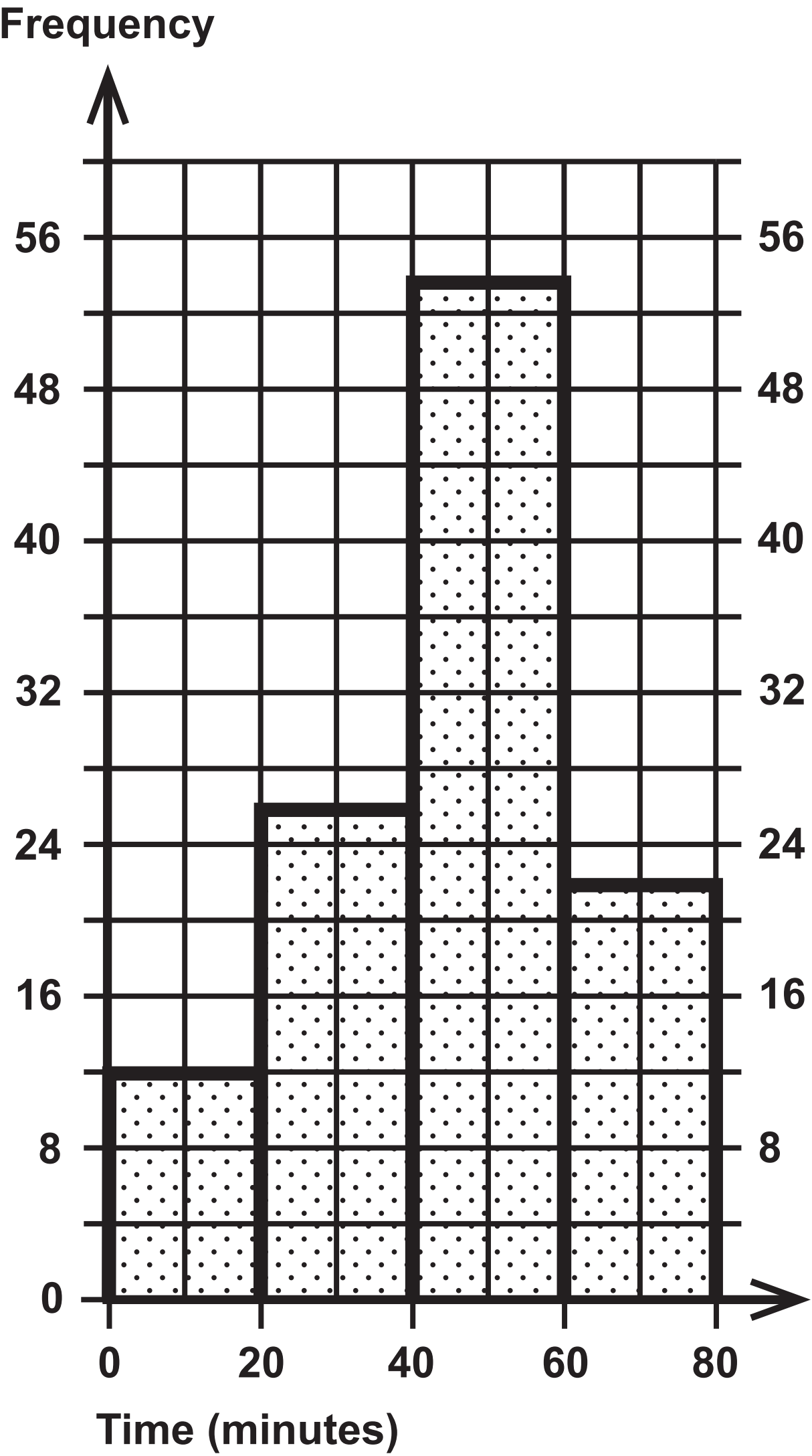
Question 3

TIME SPENT TRAINING – MEN



Question 3

TIME SPENT TRAINING – WOMEN



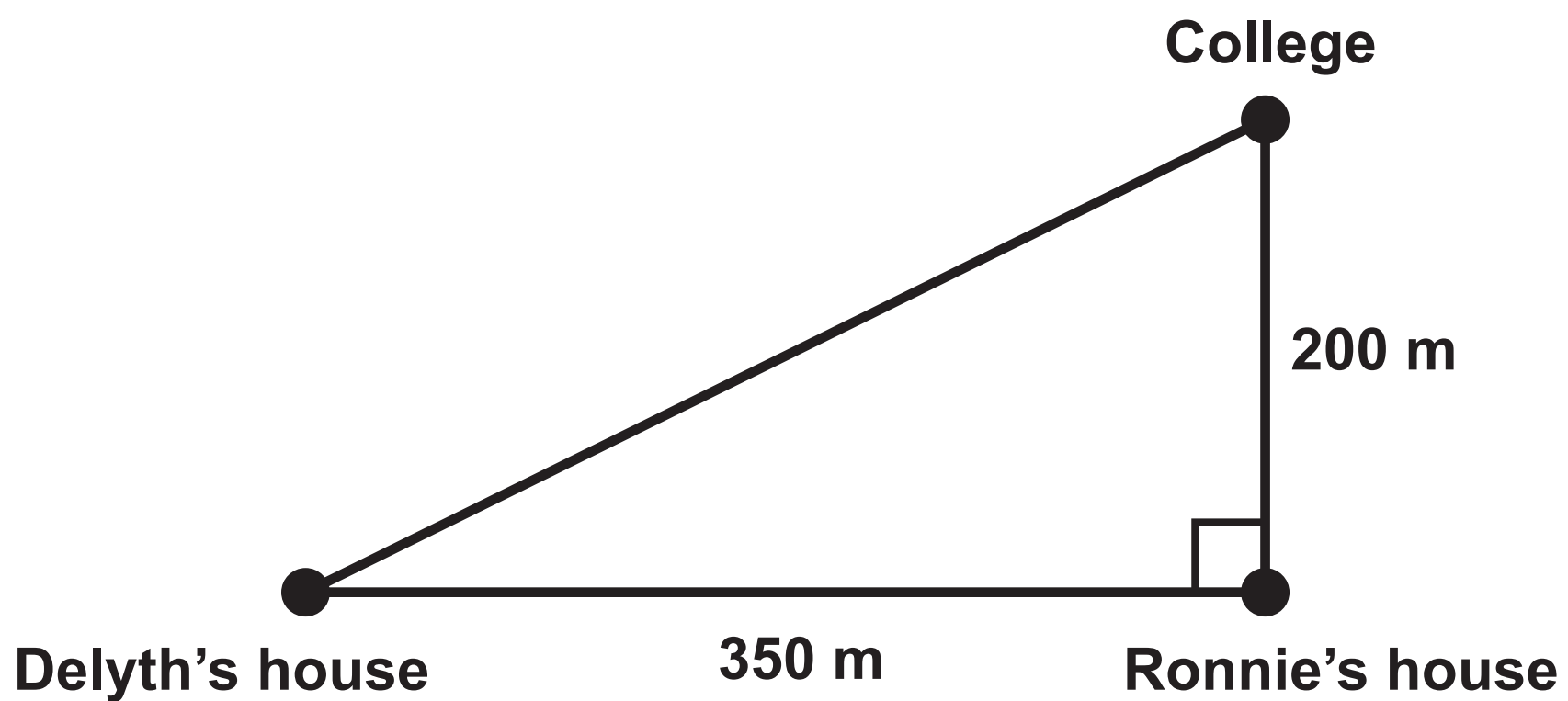
Question 5 (a)

Table

BAND	TAXABLE INCOME	TAX RATE
Personal allowance	Up to 10 000 euros	0%
Basic rate	10 000 euros to 25 000 euros	22%
Higher rate	Over 25 000 euros	35%

Question 6 (a)

Diagram NOT drawn to scale



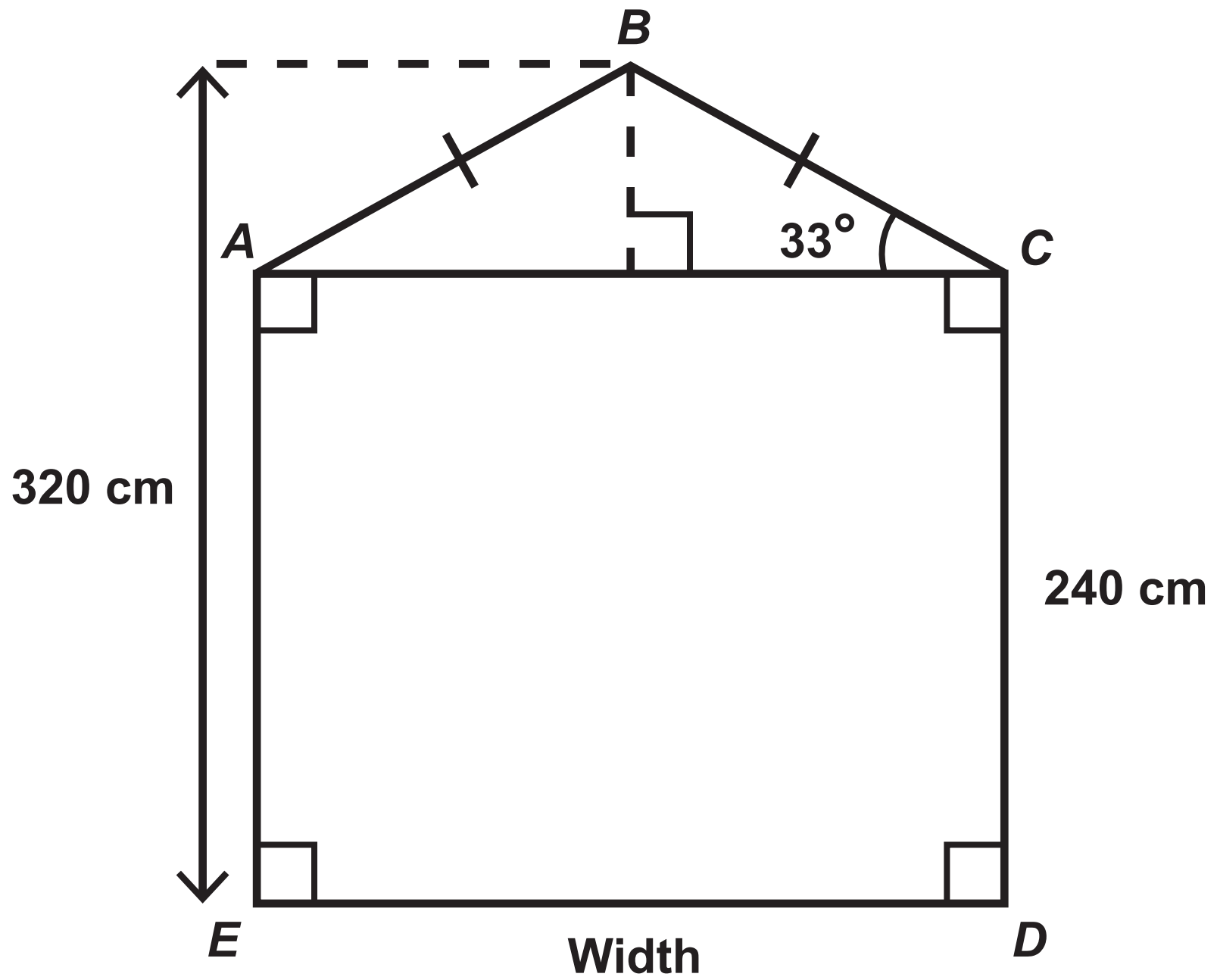
Question 6 (b)

Table

Distance, d (metres)	Frequency
$100 < d \leq 200$	9
$200 < d \leq 1000$	10
$1000 < d \leq 3000$	15
$3000 < d \leq 7000$	1

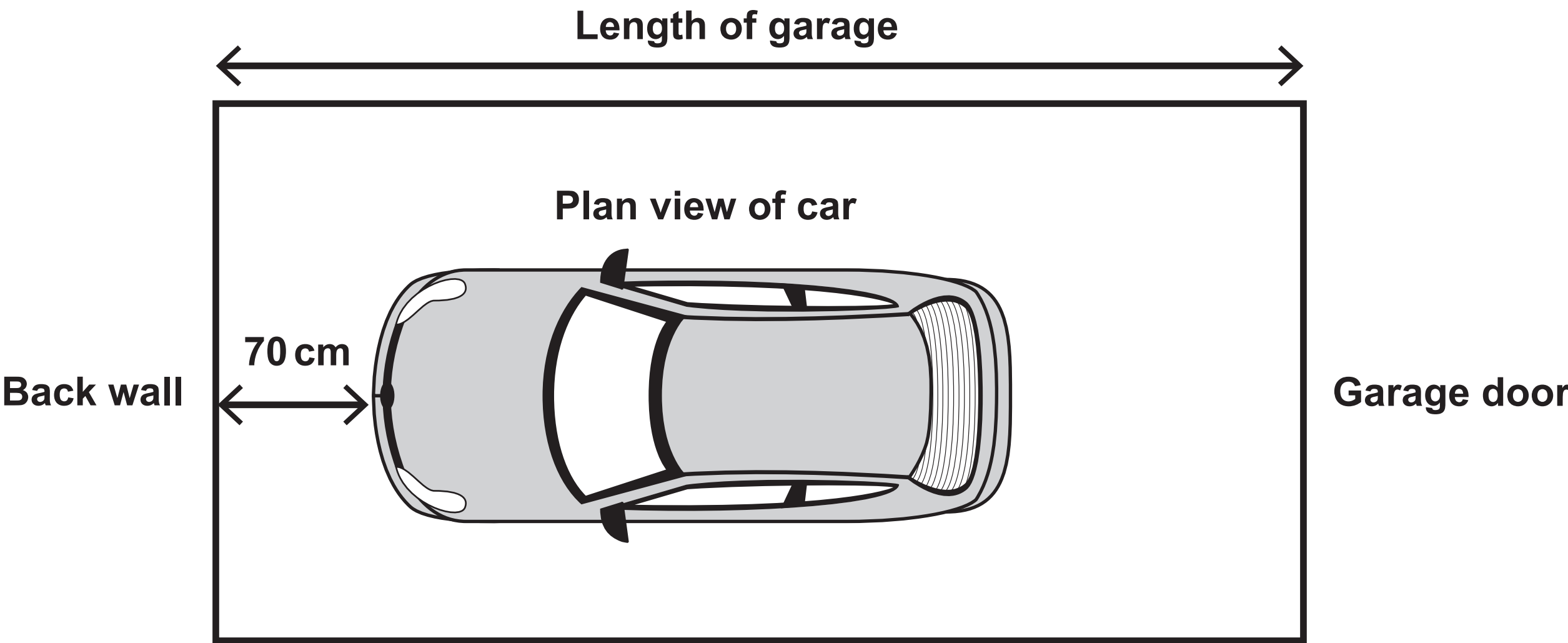
Question 7 (c)

Diagram NOT drawn to scale



Question 7 (d)

Diagram NOT drawn to scale



**GCSE
MATHEMATICS
and
NUMERACY**



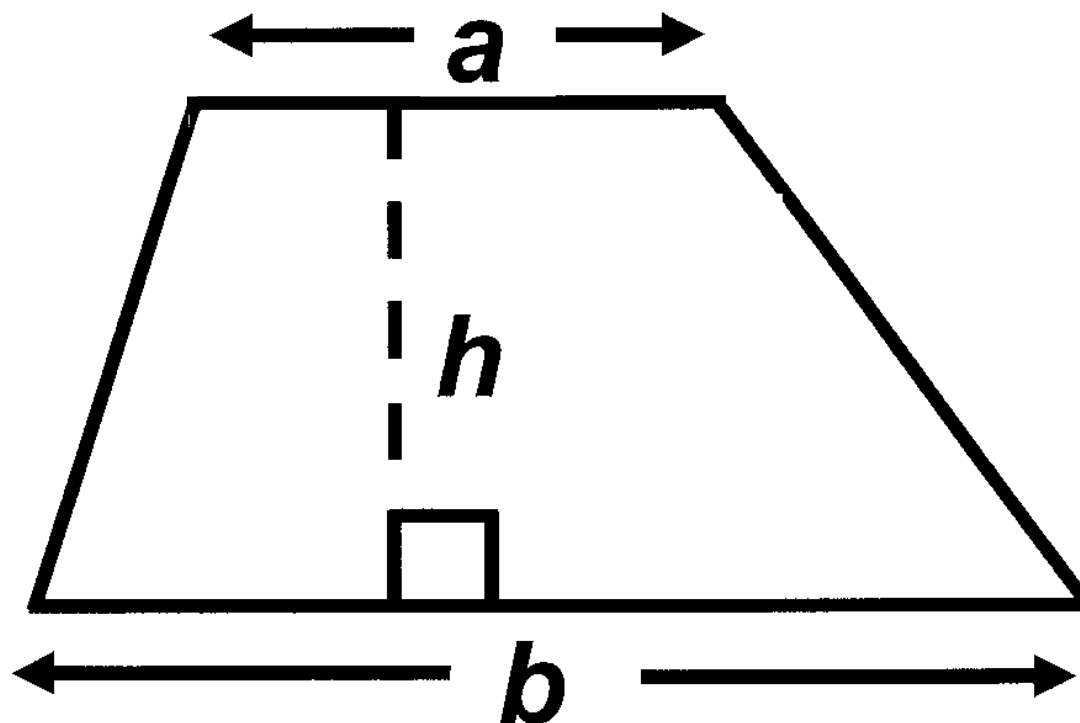
**FORMULA LIST
INTERMEDIATE TIER
GCSE**

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 $\times$ length

