



GCSE

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.

(Turn over)

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.

(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.

In question 2 (a), the assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing.

(Turn over)

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.**

continued on the next page . . .

(Turn over)

Question 1 (a) continued

**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.

continued on the next page . . .

(Turn over)

Question 1 (b) continued

1. (b) (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.**

(Turn over)

10

[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.

continued on the next page . . .

(Turn over)

Question 5 (a) continued

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.

(Turn over)

[illegible]

(Turn over)

[5 marks + 2 marks OCW]

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 .

continued on the next page . . .

(Turn over)

Question 2 (b) continued

**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.**

(Turn over)

**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 .

(Turn over)

w = _____ ☐

x = _____ ☐

y = _____ ☐

[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]

continued on the next page . . .

(Turn over)

Question 3 continued

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

14	26	34	38	76
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[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)

25

(Turn over)

[5 marks]

(Turn over)

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.

continued on the next page . . .

(Turn over)

Question 4 (a) continued

**On what day and at what time
did this flight arrive in Gatwick?
Give your answer in UK time.**

(Turn over)

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.

(Turn over)

[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.**

(Turn over)

Average speed _____ mph
[3 marks]

- 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.

continued on the next page . . .

(Turn over)

Question 5 (a) continued

**Calculate how much income
tax Viktor still owes.**

You must show all your working.

(Turn over)

36

[illegible]

[7 marks]
(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.

(Turn over)

£

[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.

continued on the next page . . .

(Turn over)

Question 6 (a) continued

**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.**

(Turn over)

[illegible]

[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 . . .

(Turn over)

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

☐

continued on the next page . . .

(Turn over)

Question 6 (b) (i) continued

**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.

(Turn over)

**Estimate of the mean distance travelled
by these 35 students is**

_____ m [4 marks]

continued on the next page . . .

(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.

continued on the next page . . .

(Turn over)

Question 6 (c) continued

**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.**

(Turn over)

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.

[illegible]

[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]

continued on the next page . . .

(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**

$$**AB = BC**$$

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

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

continued on the next page . . .

(Turn over)

Question 7 (c) continued

**Calculate the width of
Matteo's garage.**

(Turn over)

[illegible]

(Turn over)

[5 marks]

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.

continued on the next page . . .

(Turn over)

Question 7 (d) continued

**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.**

60

[3 marks]

(Turn over)

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]

continued on the next page . . .

(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.**

(Turn over)

[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)

[illegible]

(Turn over)

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

[illegible]

3310U40-1

THURSDAY, 10 NOVEMBER 2022 – MORNING

**MATHEMATICS – NUMERACY
UNIT 2: CALCULATOR – ALLOWED
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 _____

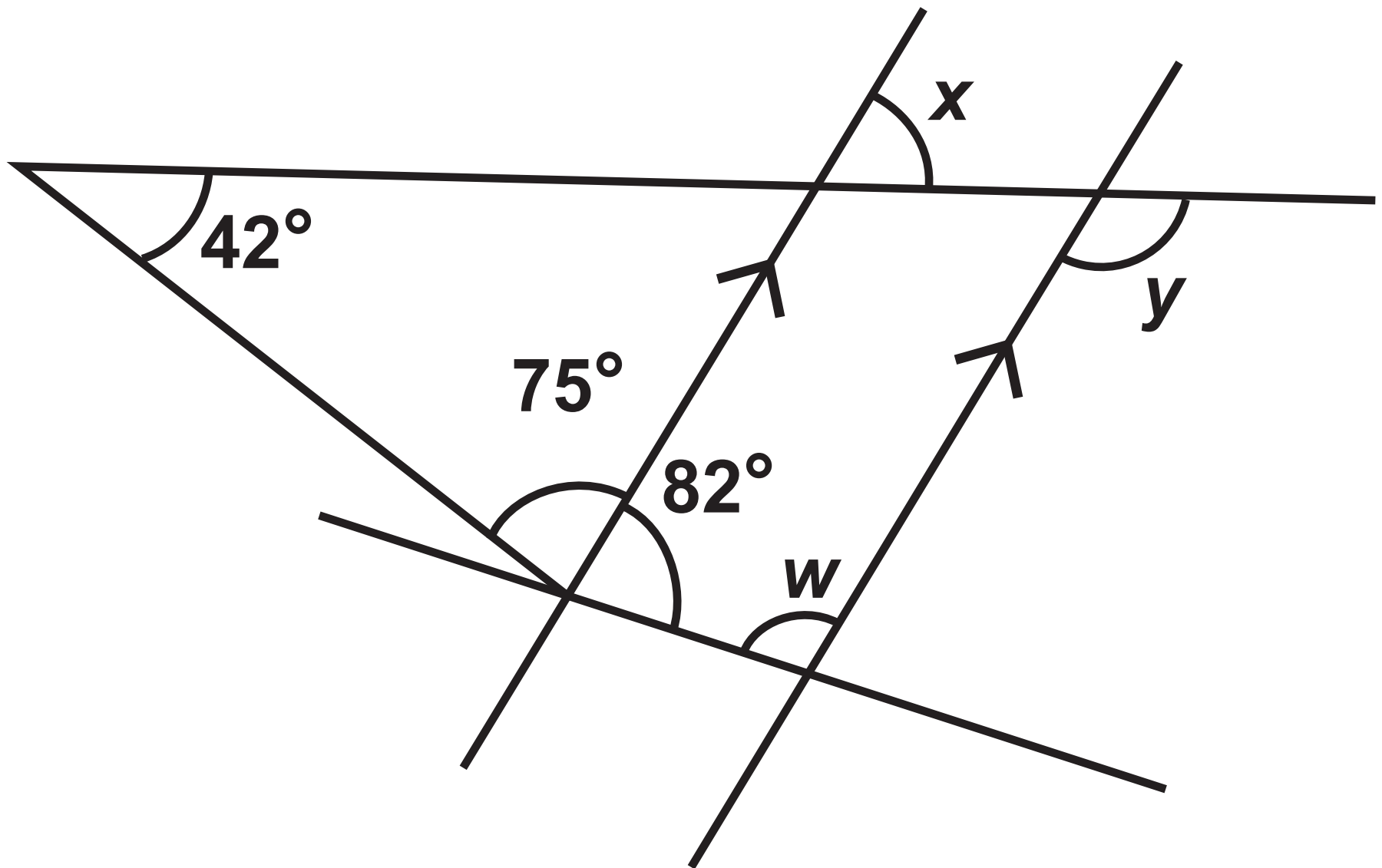
Question 1 (b)

Pie chart



Question 2 (c)

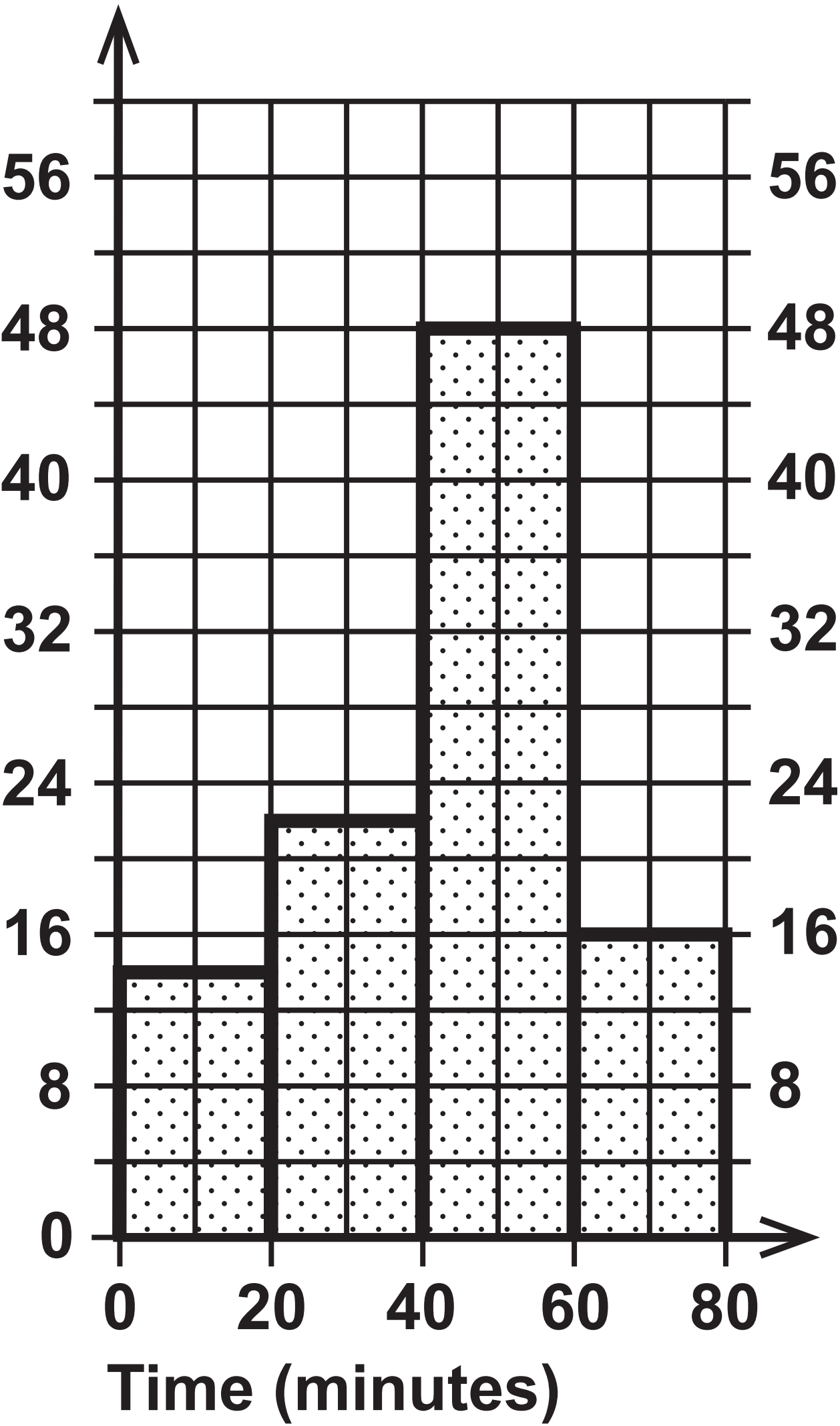
Diagram NOT drawn to scale



Question 3

TIME SPENT TRAINING – MEN

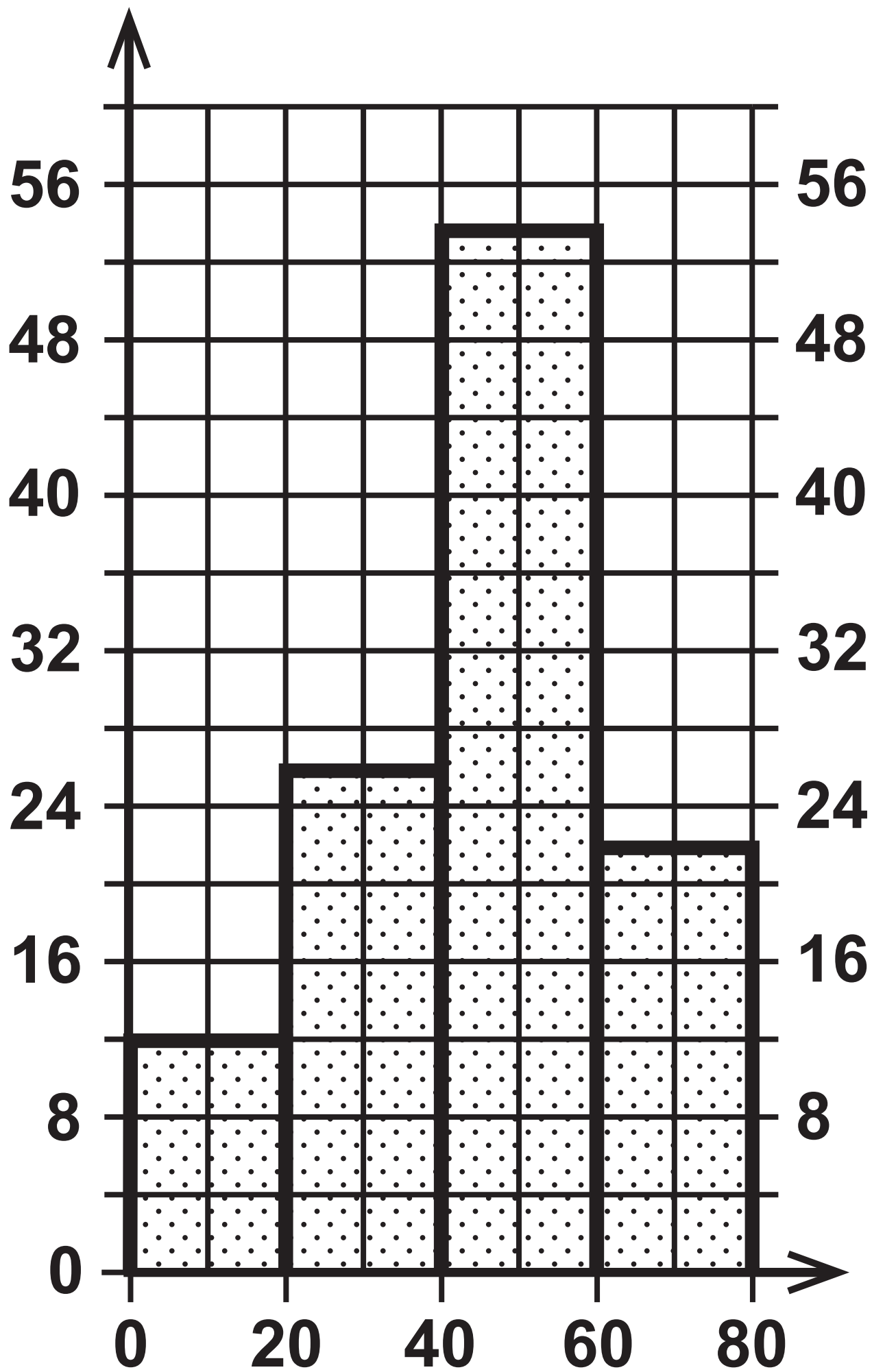
Frequency



Question 3

TIME SPENT TRAINING – WOMEN

Frequency



Time (minutes)

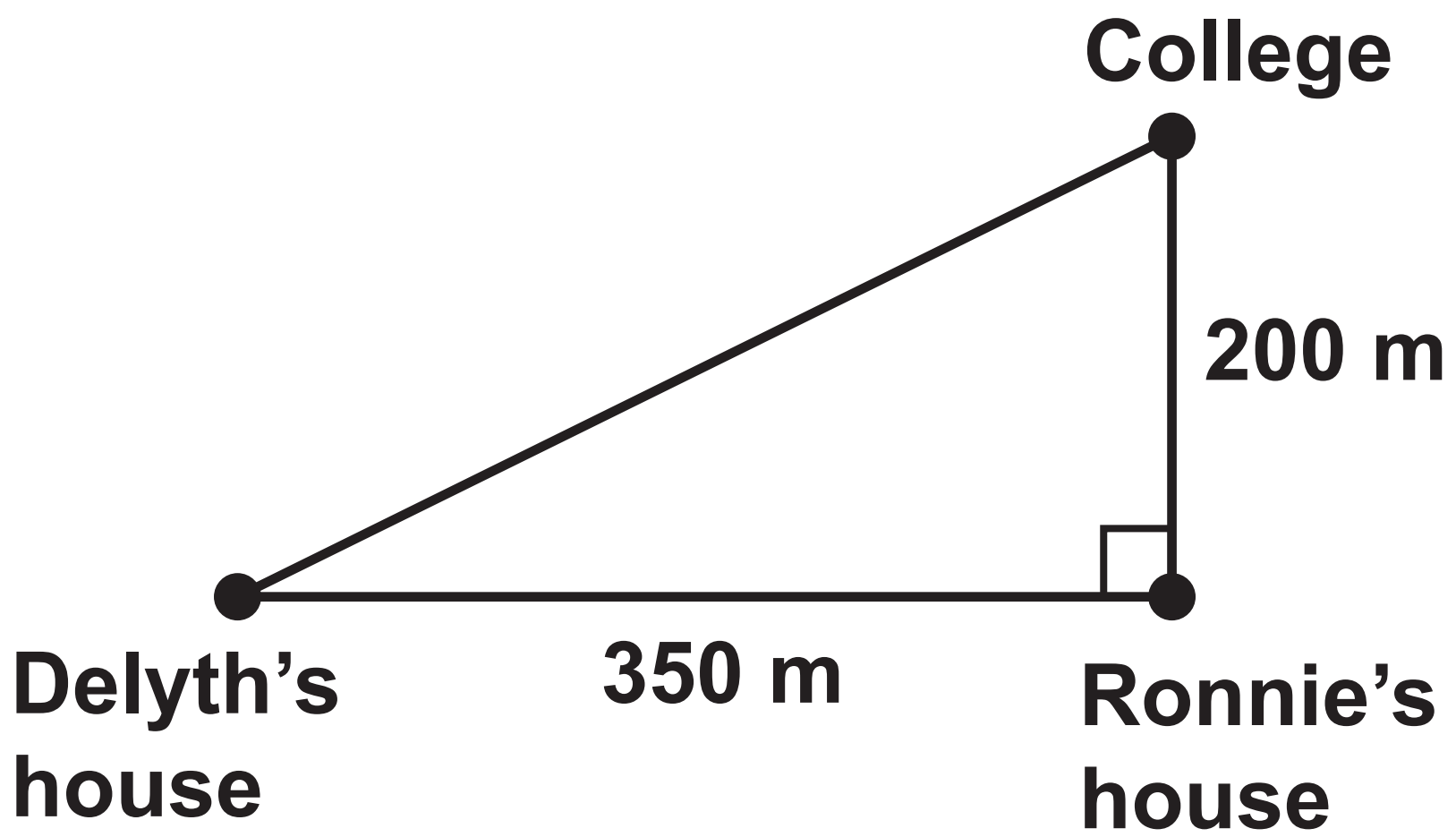
Question 5 (a)

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



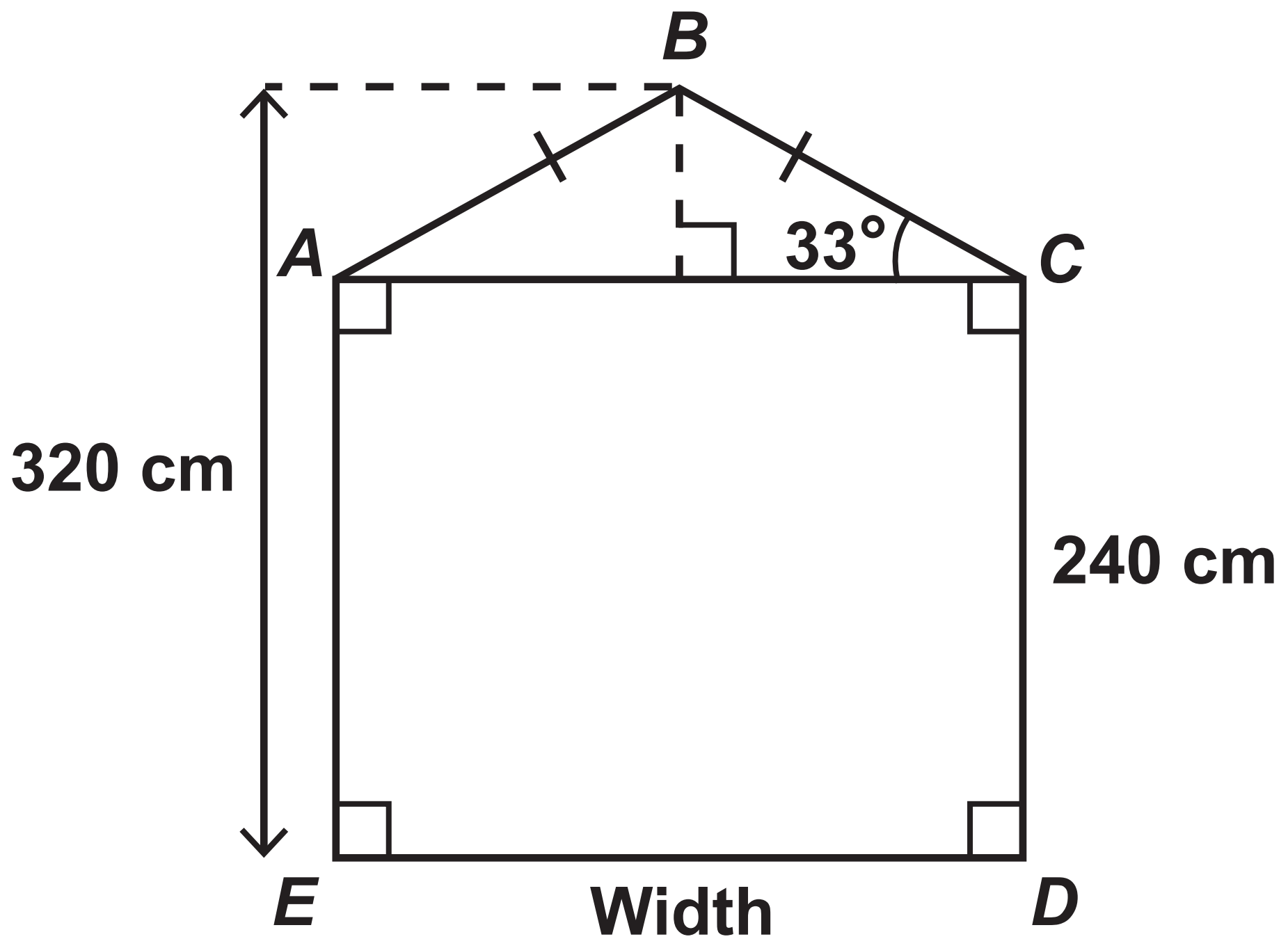
Question 6 (b)

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

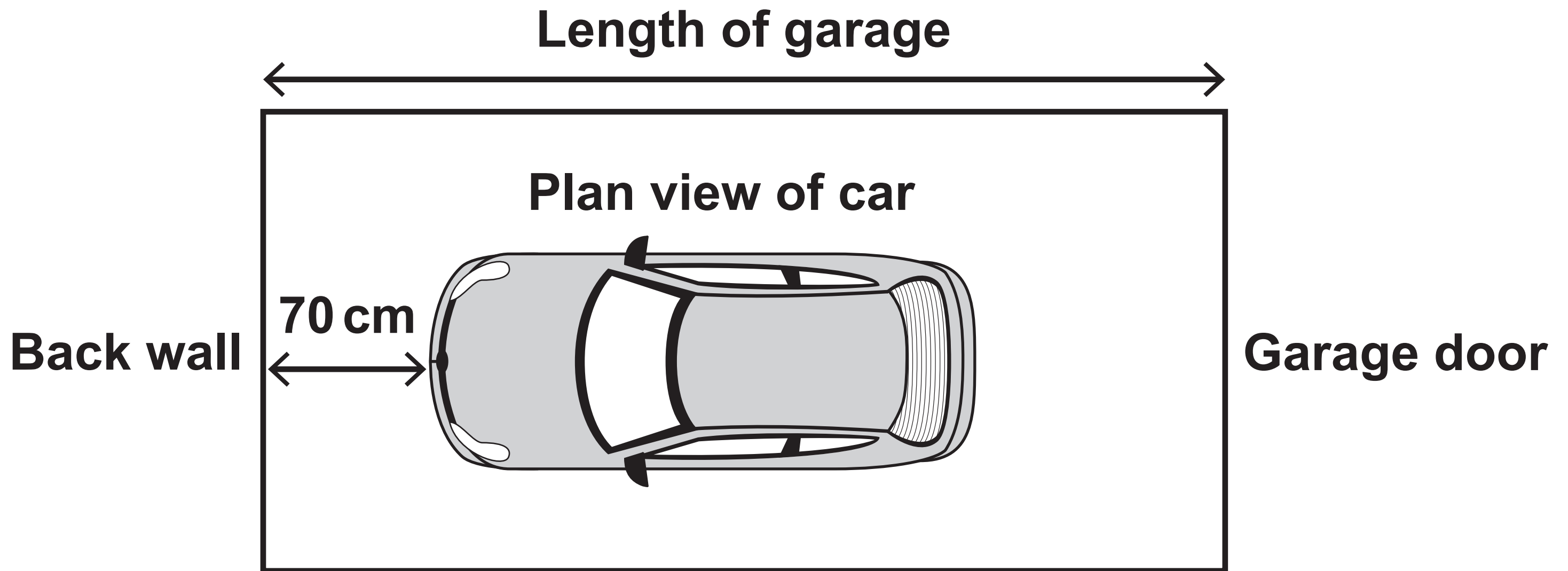
Question 7 (c)

Diagram NOT drawn to scale



Question 7 (d)

Diagram NOT drawn to scale



**GCSE
MATHEMATICS
and
NUMERACY**



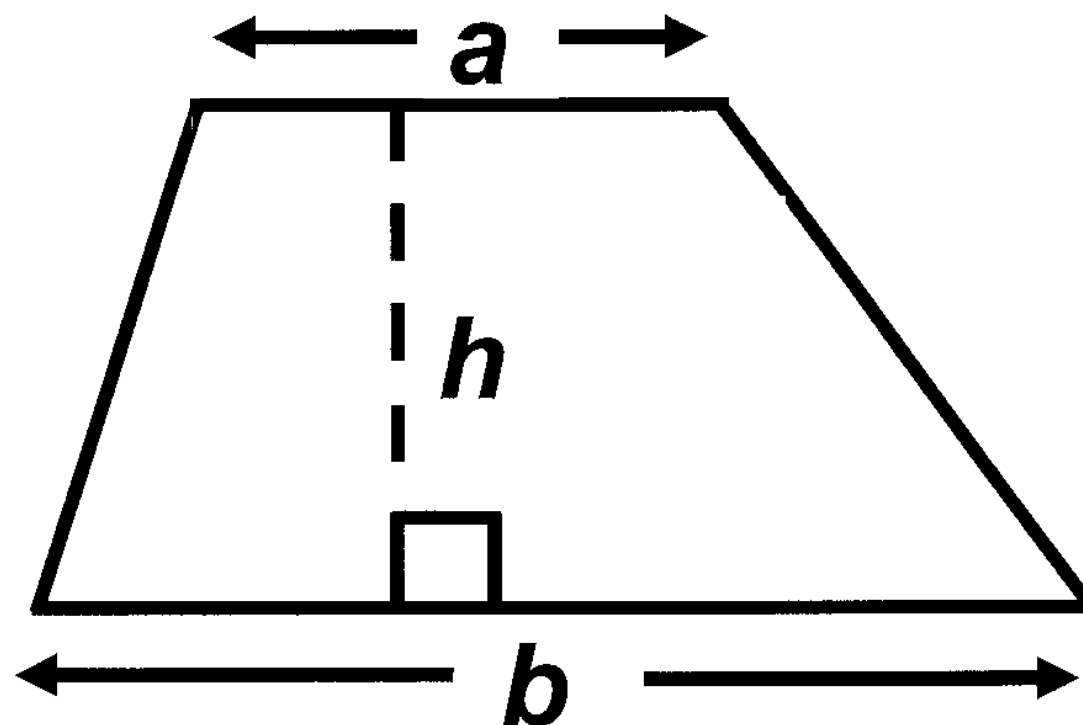
**FORMULA LIST
INTERMEDIATE TIER
GCSE**

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

