



GCSE

3310U40–1

THURSDAY, 7 NOVEMBER 2024 – 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 PAPER**

Surname: _____

First name(s): _____

Centre Number: _____

Candidate Number: 0 _____

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

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.

Models for Question 4.

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 this booklet, taking care to number the question(s) correctly.

Take π as $3 \cdot 14$ 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 5, the assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing.

(Turn over)

1. Look at the diagram for Question 1 in the separate Diagram Booklet. The diagram shows a graph. Yesterday, Jemila cycled along a straight track from home to the beach and back.

(a) For how many minutes was Jemila 17.5 km from home?

_____ minutes

[1 mark]

continued on the next page . . .

(Turn over)

Question 1 continued

1. (b) At what time did Jemila first start cycling in the direction of home?
Circle your answer.

13:30	14:15	15:00	15:30	16:00
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[1 mark]

continued on the next page . . .

(Turn over)

Question 1 continued

1. (c) By 15:30, how many kilometres in total had Jemila cycled?

_____ km

[1 mark]

continued on the next page . . .

(Turn over)

Question 1 continued

**1. (d) Jemila was due to get home
at 16:30**

She arrived home early.

**Approximately how many minutes
early was she?**

_____ minutes

[1 mark]

(Turn over)

2. (a) Lewis buys an annual discount card to use in a sports shop. He pays £9.95 for the discount card.

For one year, Lewis gets 15% off anything he buys in this sports shop when he shows his discount card.

During the year, Lewis buys the following three items.

Full price BEFORE discount		
Trainers £55	Tennis racket £18	T – shirt £12

continued on the next page . . .

(Turn over)

[4 marks]

continued on the next page . . .

(Turn over)

Question 2 continued

- 2. (b) Sally buys clothes from the same sports shop.
She does not have a discount card.**

In a sale, there is $\frac{1}{6}$ off the full price of a hoodie.

On the last day of the sale, customers could buy the hoodie for half of the sale price.

continued on the next page . . .

(Turn over)

Question 2 (b) continued

Sally buys the hoodie on the last day of the sale.

What fraction of the original full price of the hoodie does Sally pay?

[2 marks]

(Turn over)

- 3. Look at the diagram for Question 3 in the separate Diagram Booklet. The diagram is a Venn diagram. A music teacher asked all Year 7 students to choose which musical instruments they would like to be able to play. They could choose from three instruments: guitar, drums and violin. The students could choose as many of these instruments as they wished. The Venn diagram shows the results.**

(a) How many students did not choose an instrument?

_____ students

[1 mark]

continued on the next page . . .

(Turn over)

Question 3 continued

**3. (b) How many students chose
all 3 instruments?**

_____ students

[1 mark]

**(c) How many Year 7 students
were there?**

_____ students

[1 mark]

continued on the next page . . .

(Turn over)

Question 3 continued

3. (d) How many students chose 2 or more instruments?

_____ students

[1 mark]

continued on the next page . . .

(Turn over)

Question 3 continued

3. (e) Which was the least popular instrument?

How many students chose this instrument?

Least popular instrument

Number of students _____

[1 mark]

4. Ask for the models for Question 4. The models are NOT made to scale. PressiePacs is a company that designs and makes presentation boxes.

(a) The models represent two designs, small and large.

The small presentation box has the following dimensions:

Length = 10 cm

Width = 10 cm

Height = 10 cm

The large presentation box has the following dimensions:

Length = 12.5 cm

Width = 12.5 cm

continued on the next page . . .

(Turn over)

Question 4 (a) continued

PressiePacs wants the large box to have TWICE the volume of the small box.

Calculate the height of the large box.

[5 marks]

4. (b) Look at the formula for Question 4 (b) in the separate Diagram Booklet.
Customers can use the formula shown to calculate the cost of a presentation box.

Remember: The small presentation box has the following dimensions:

Length = 10 cm

Width = 10 cm

Height = 10 cm

continued on the next page . . .

(Turn over)

5. IN THIS QUESTION, YOU WILL BE ASSESSED ON THE QUALITY OF YOUR ORGANISATION, COMMUNICATION AND ACCURACY IN WRITING.

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

The diagram is a pie chart.

72 000 people were asked to state their main way of travelling to work. The results are shown accurately in the pie chart.

The people who said ‘Public transport’ travel to work EITHER by bus OR by train.

For every person who travels to work by bus, there are 4 people who travel by train.

continued on the next page . . .

(Turn over)

[4 marks + 2 marks OCW]

6. Look at the diagram for Question 6 in the separate Diagram Booklet.
The diagram is NOT drawn to scale.
The diagram shows a plan of a floor labelled *ABC*.

In the diagram:

$$AC = 2.7 \text{ metres}$$

$$CB = 4.3 \text{ metres}$$

Angle *ACB* is a right angle

Alfred has been given the job of varnishing the floor.

One tin of varnish contains enough to cover an area of 1.6 m^2

continued on the next page . . .

(Turn over)

[4 marks]

(Turn over)

7. (a) Steffan uses 654 kWh of electricity in a three-month period.

Electricity costs £0.30 per kWh. The standing charge for the three-month period is £54 Steffan has to pay VAT at 5% on the TOTAL cost.

Calculate Steffan's electricity bill. You must show all your working.

[3 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 represents a fridge – freezer.**

Steffan is thinking of buying the fridge – freeze shown in the diagram.

The width is 600 mm.

The height is 1800 mm.

Steffan needs to check that the FREEZER compartment of this fridge – freezer has enough room.

continued on the next page . . .

(Turn over)

Question 7 (c) continued

The height of the freezer door
is $\frac{2}{5}$ of the total height of
the fridge – freezer.

Calculate the length of the
DIAGONAL of the freezer door.
Give your answer in millimetres.
You must show all your working.

(Turn over)

[5 marks]

(Turn over)

8. (a) A small packet contains four Caru chocolate cakes.

The four cakes have a total mass of 84 g.

- (i) The following information is written on the packet:

‘Caru chocolate cakes contain 600 calories per 100 g.’

Simon aims for a calorie intake of 2400 calories per day.

continued on the next page . . .

(Turn over)

[5 marks]

continued on the next page . . .

(Turn over)

Question 8 (a) continued

8. (a) (ii) Caru chocolate cakes contain only fat, carbohydrate, protein and salt.

Look at the information for Question 8 (a) (ii) in the separate Diagram Booklet. The information shows a ratio.

How many grams of protein are there in an 84 g packet of four cakes?

Give your answer correct to 2 significant figures.

[3 marks]

continued on the next page . . .

(Turn over)

Question 8 continued

8. (b) Cheryl keeps fit by running every day.

(i) Cheryl has a mass of 143 pounds.

What is Cheryl's mass in kg?

_____ kg

[2 marks]

continued on the next page . . .

(Turn over)

Question 8 (b) continued

8. (b) (ii) Cheryl burns 690 calories per hour when she runs. Eating a banana gives Cheryl 92 calories of energy.

Cheryl wants to burn off the energy in this banana. For how many minutes would she need to run? You must show all your working.

(Turn over)

_____ minutes

[3 marks]

continued on the next page . . .

(Turn over)

9. (a) Look at the diagram for Question 9 (a) in the separate Diagram Booklet. The diagram is NOT drawn to scale.

The base of a flagpole is fixed to horizontal ground.

It is held vertically by a straight rod of length 3.8 metres.

The rod is fixed to the ground and to a point 1.5 metres from the top of the flagpole.

The flagpole and the rod are shown in the diagram.

Calculate the TOTAL height of the flagpole.

Give your answer correct to the nearest centimetre.

Question 9 continued

- 9. (b) Look at the diagrams for Question 9 (b) in the separate Diagram Booklet. The diagrams are NOT drawn to scale. Mathematically similar large, medium and small flags are shown.**
- (i) Calculate the length of the medium flag.**

(Turn over)

Length of the medium flag

is _____ cm

[2 marks]

continued on the next page . . .

(Turn over)

Question 9 (b) continued

9. (b) (ii) Calculate the height of the small flag.

Height of the small flag

is _____ cm

[2 marks]

(Turn over)

10. Aderyn is a company that makes bird feeders.

Squirrels often try to steal food from bird feeders.

To make this more difficult, Aderyn has designed a NEW bird feeder.

Aderyn tests its new feeder to check how long it takes squirrels to reach the food inside.

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

The diagram is a cumulative frequency diagram.

The results are displayed in this cumulative frequency diagram.

continued on the next page . . .

(Turn over)

Question 10 continued

10. (a) Look at the table for Question 10 (a) in the separate Diagram Booklet. Aderyn has this information about the time it took squirrels to reach the food in its ORIGINAL bird feeder.

Aderyn compared the times squirrels take to reach the food in the original bird feeder and the times they take to reach food in the new bird feeder.

continued on the next page . . .

(Turn over)

Question 10 (a) continued

10. (a) (i) Complete this sentence:

**‘The modal group for
the new bird feeder is
between _____
and _____ seconds.’**

**Does the modal group for the
new bird feeder imply that
there is an improvement in
the times?**

Yes **No**

[1 mark]

(Turn over)

Question 10 (a) continued

10. (a) (ii) Use the cumulative frequency diagram and the table for Question 10 in the Diagram Booklet to give the best estimate to complete each of the following sentences.

I. ‘The difference between the median times is _____ seconds.’

[1 mark]

continued on the next page . . .

(Turn over)

Question 10 (a) (ii) continued

10. (a) (ii) II. 'The difference between the interquartile ranges of the times is _____ seconds.'

[2 marks]

continued on the next page . . .

(Turn over)

Question 10 continued

10. (b) Use the cumulative frequency diagram for Question 10 in the Diagram Booklet to give the best estimate to complete the following sentence.

**‘20% of the squirrels took
_____ seconds or
more to reach the food
in the new bird feeder.’**

[3 marks]

Question 10 continued

- 10. (c) The population density of grey squirrels in forests depends on the variety of tree that grows there.**

Look at the table for Question 10 (c) in the separate Diagram Booklet.

Rhian says,

“I know that Maesgwyn forest has only one variety of tree: oak, chestnut or pine.”

continued on the next page . . .

(Turn over)

Question 10 (c) continued

Maesgwyn forest covers an area of 21 500 m²

There are 24 grey squirrels living in Maesgwyn forest.

From this information, which variety of tree is most likely to be found in Maesgwyn forest?

You must show working to support your answer.

Oak

Chestnut

Pine



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UNIT 2: CALCULATOR – ALLOWED
INTERMEDIATE TIER**

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

Diagram Booklet

Surname: _____

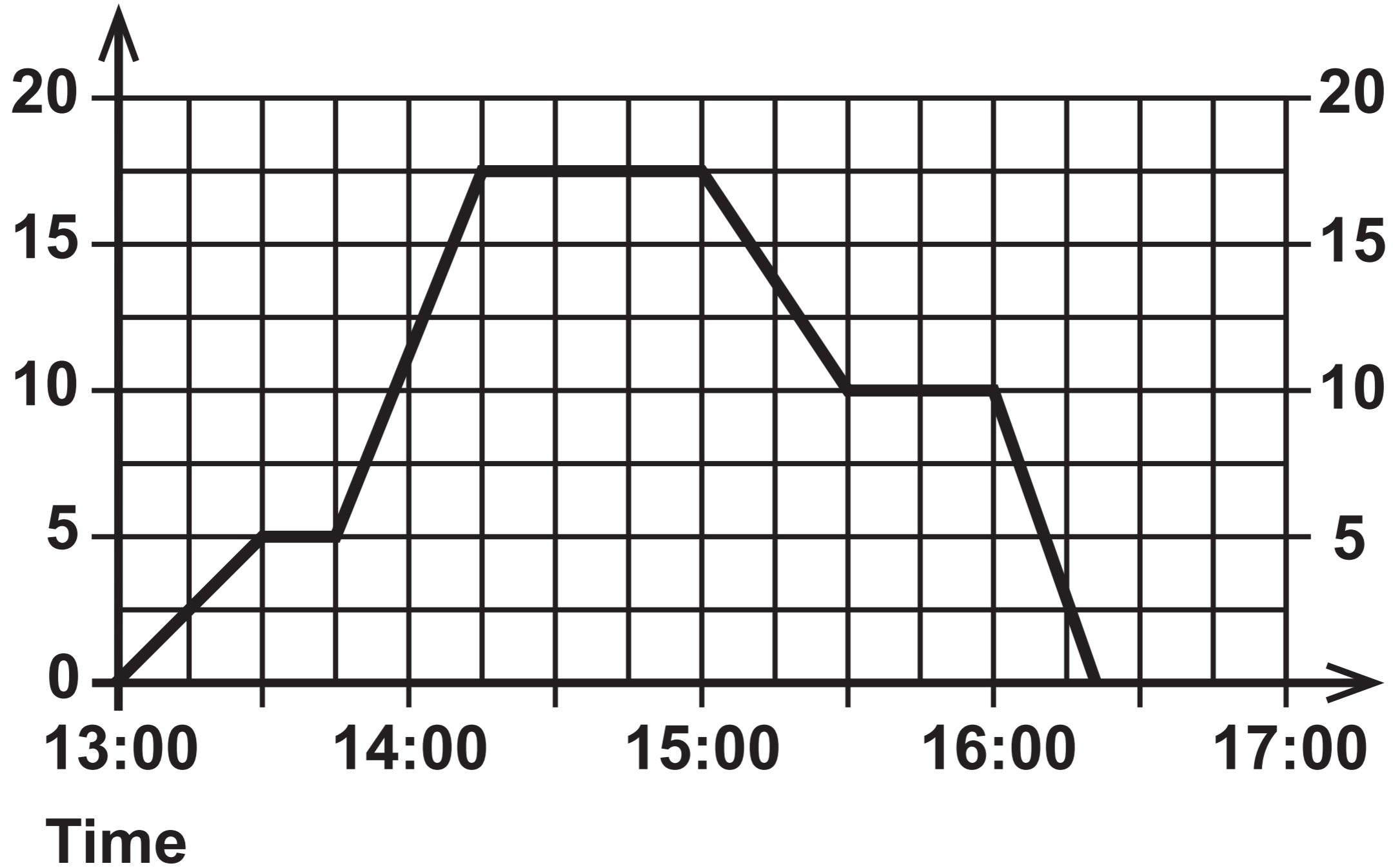
First name(s): _____

Centre Number: _____

Candidate Number: 0 _____

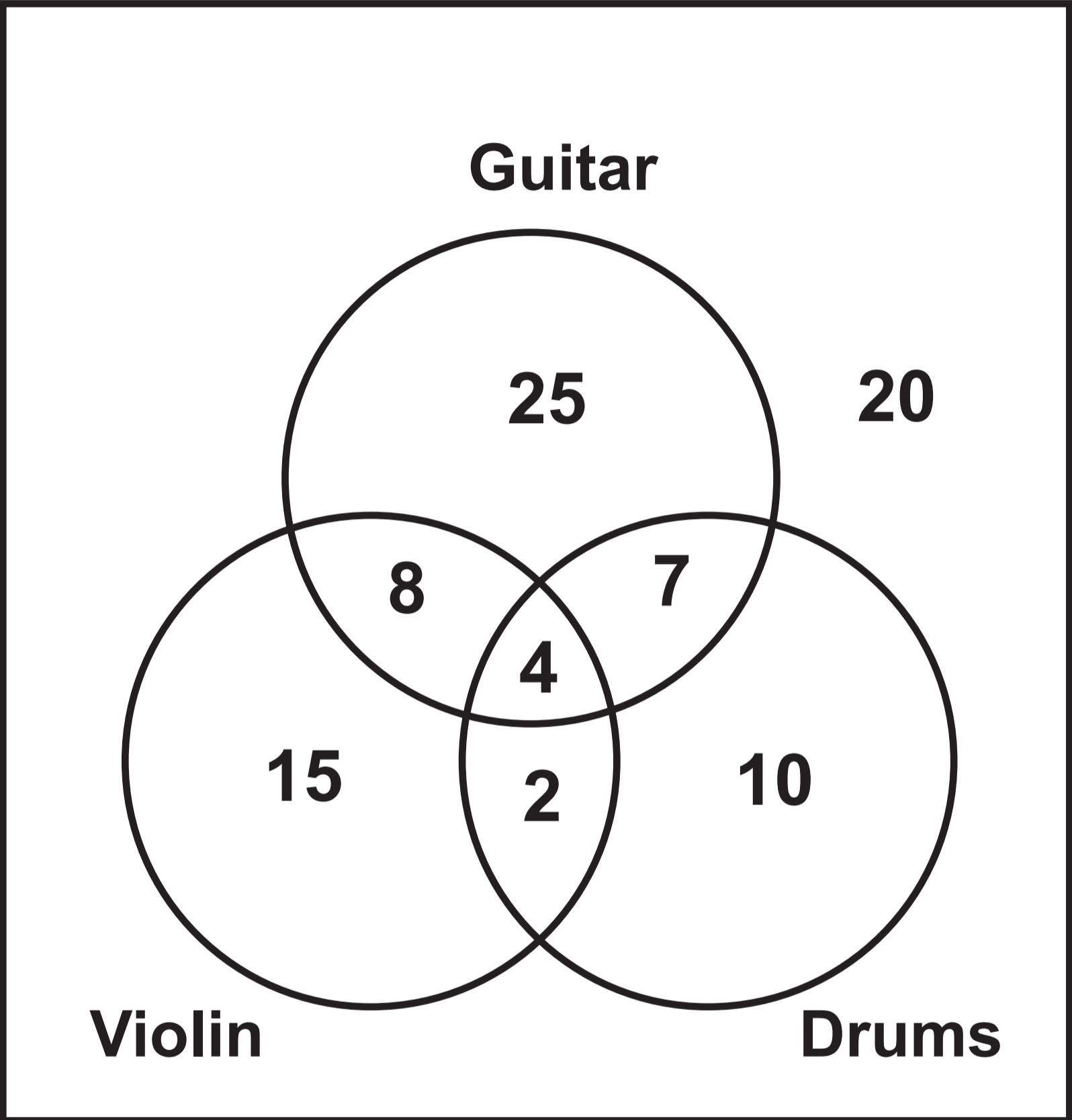
Question 1

Distance from home (km)



Question 3

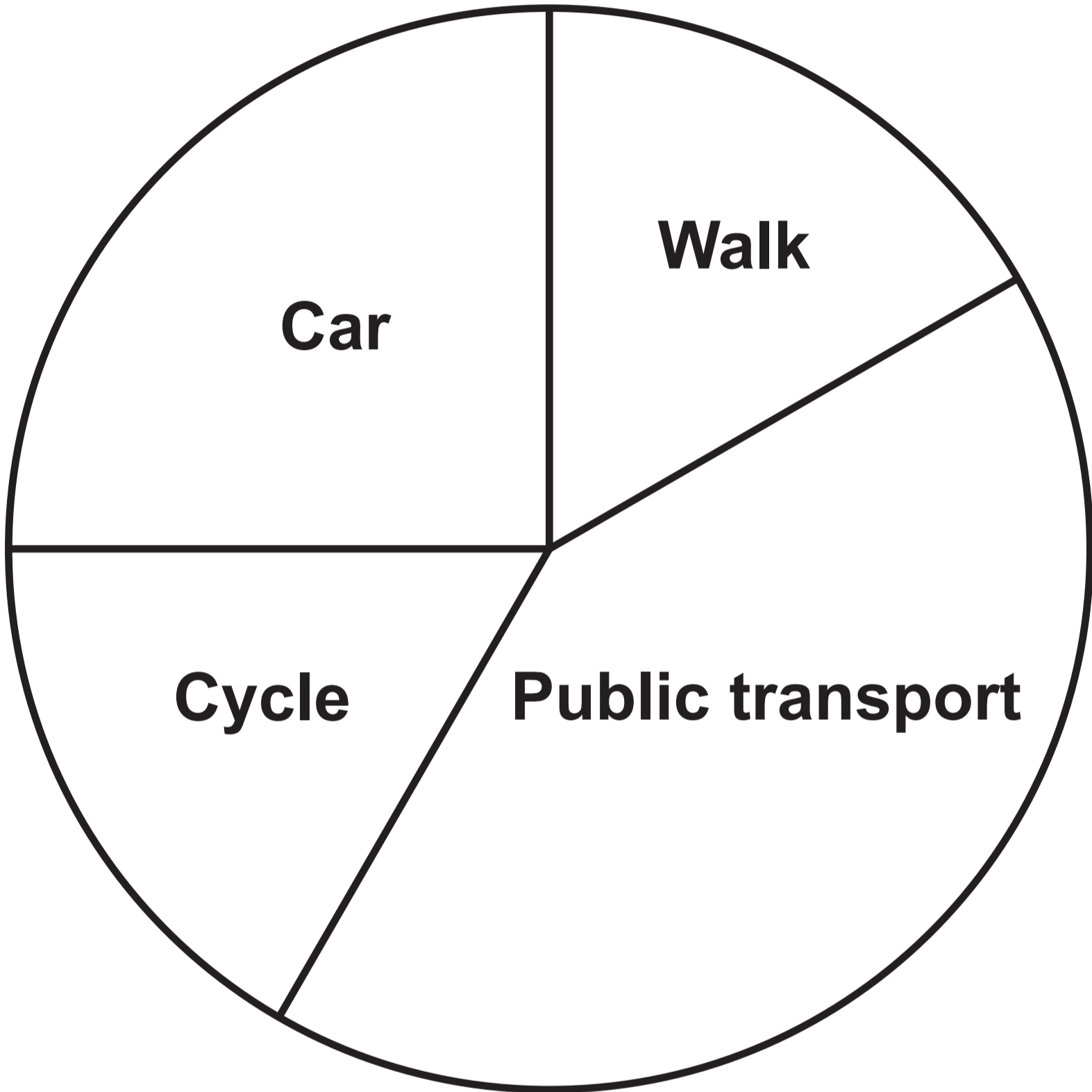
£



Question 4 (b)

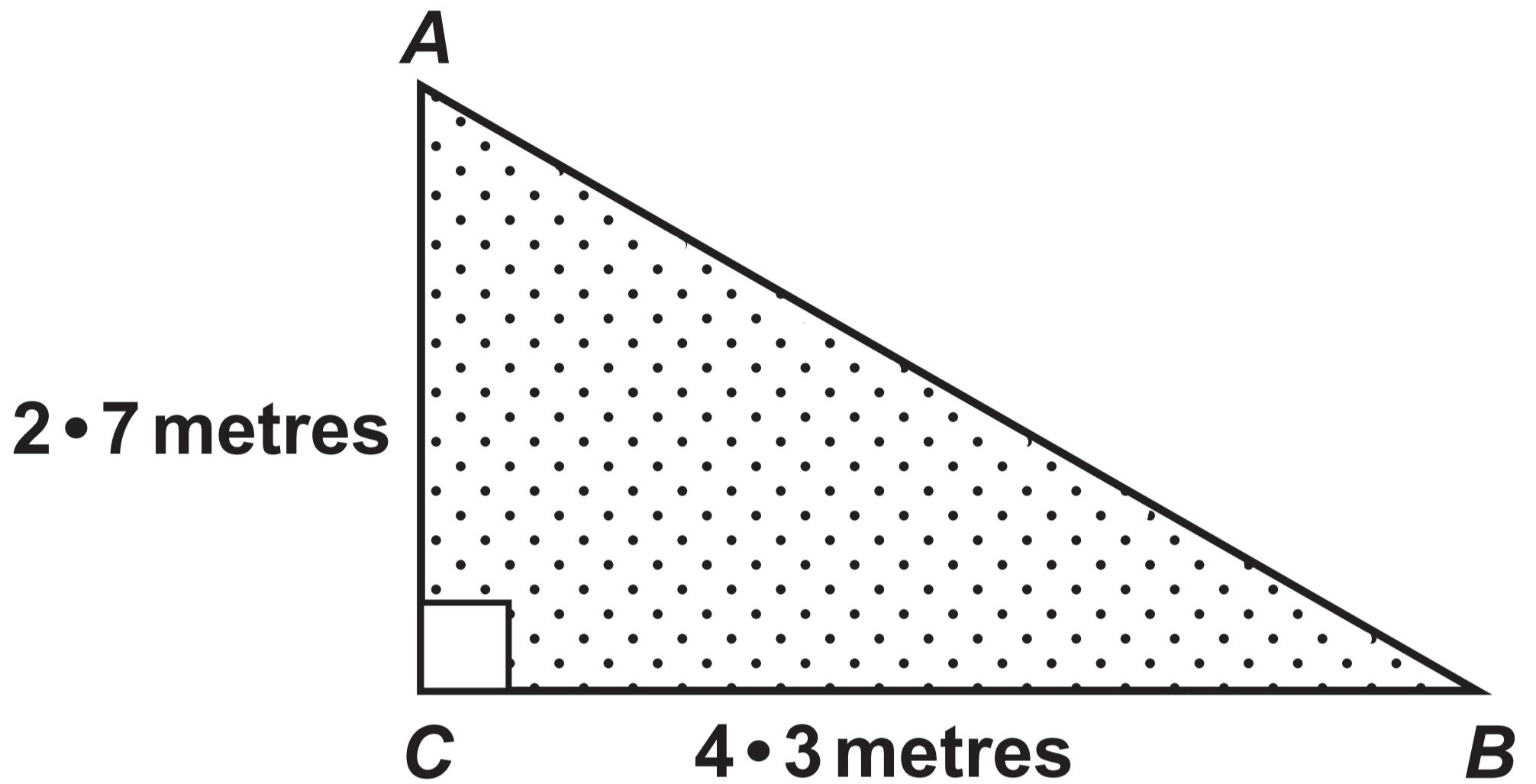
Cost in £ = Surface area of the box in $\text{cm}^2 \div 240$

Question 5



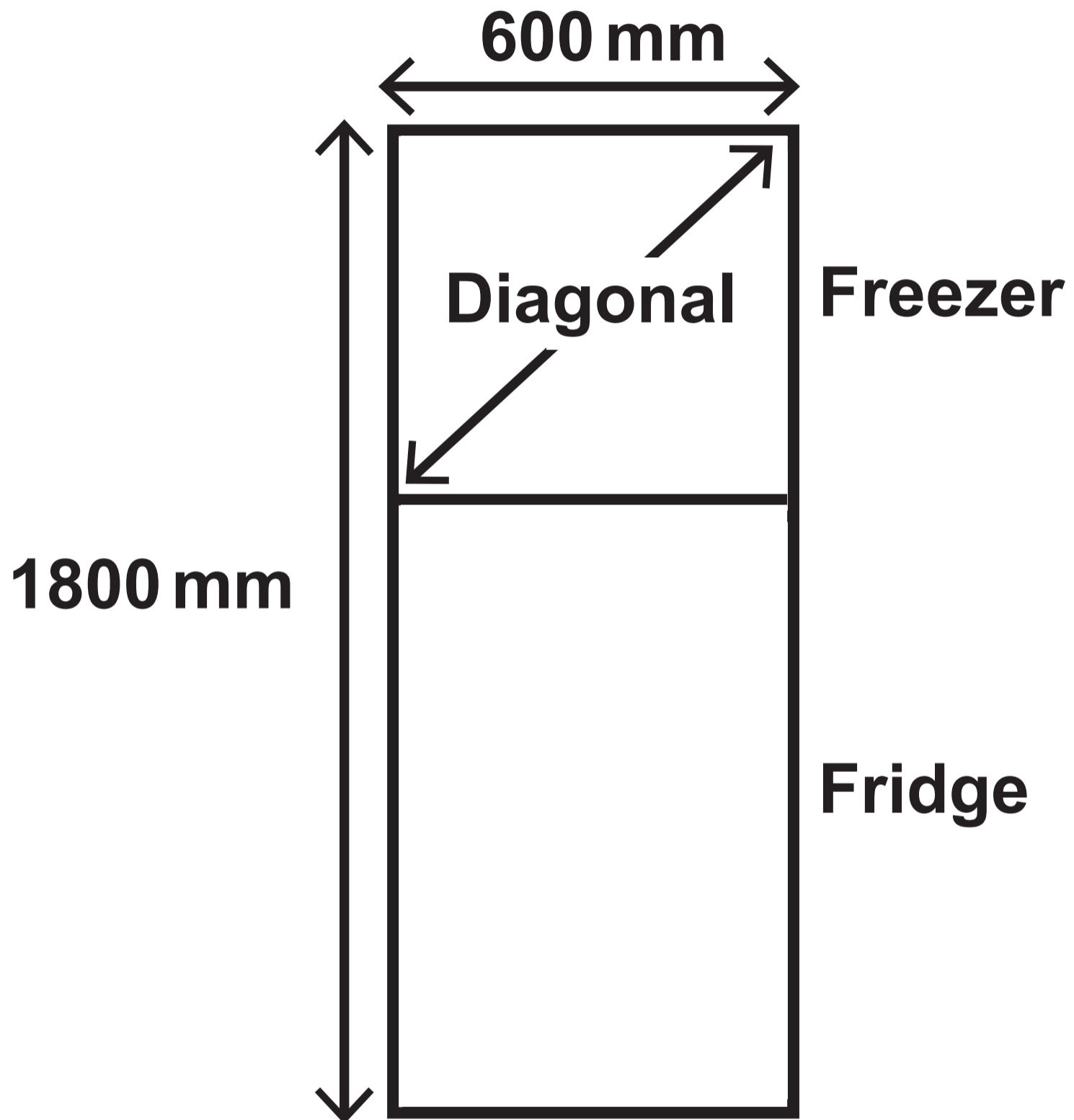
Question 6

Diagram NOT drawn to scale



Question 7 (c)

Diagram NOT drawn to scale



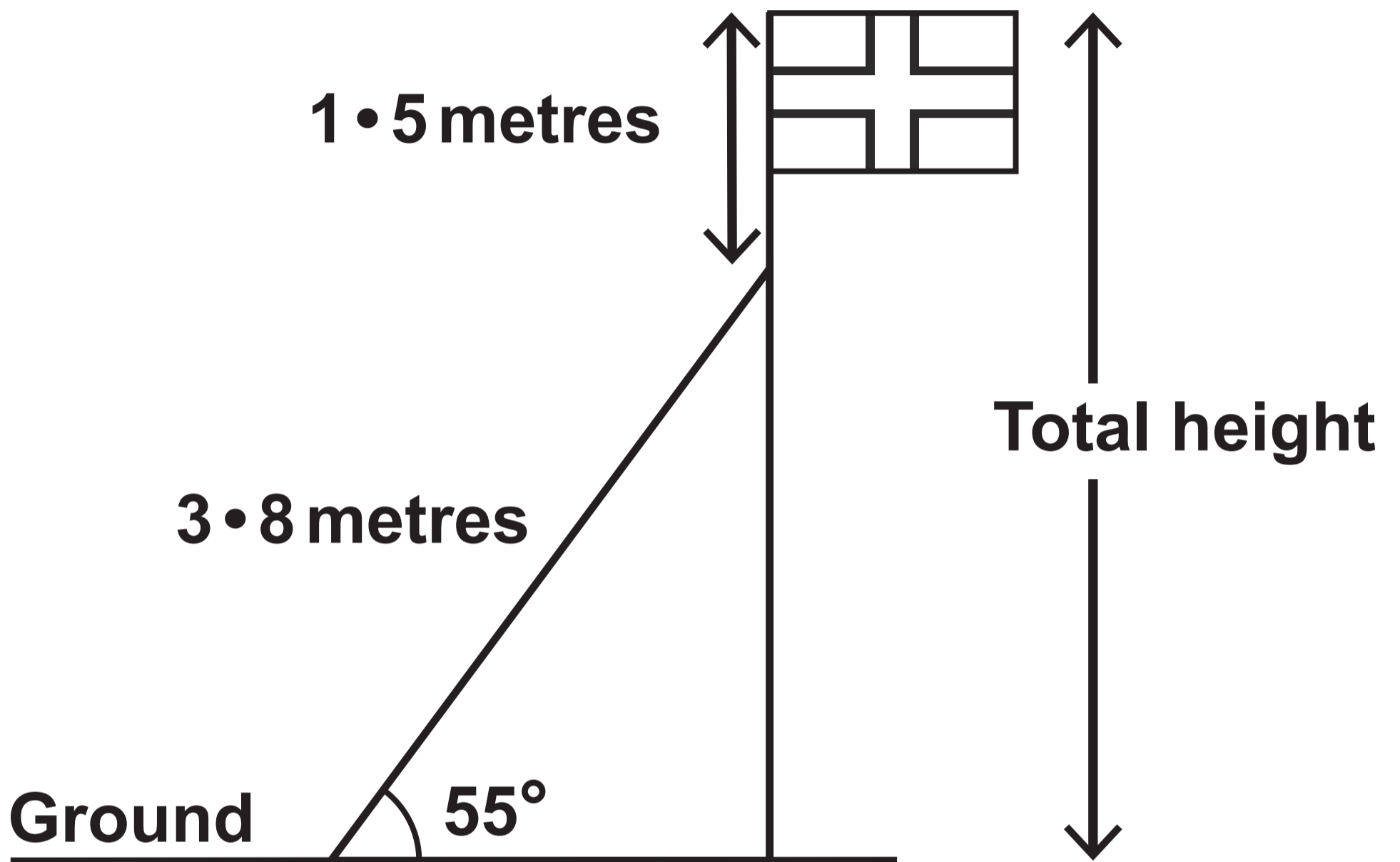
Question 8 (a) (ii)

The ratio of the masses is

fat : carbohydrate : protein : salt = 1360 : 2725 : 515 : 4

Question 9 (a)

Diagram NOT drawn to scale



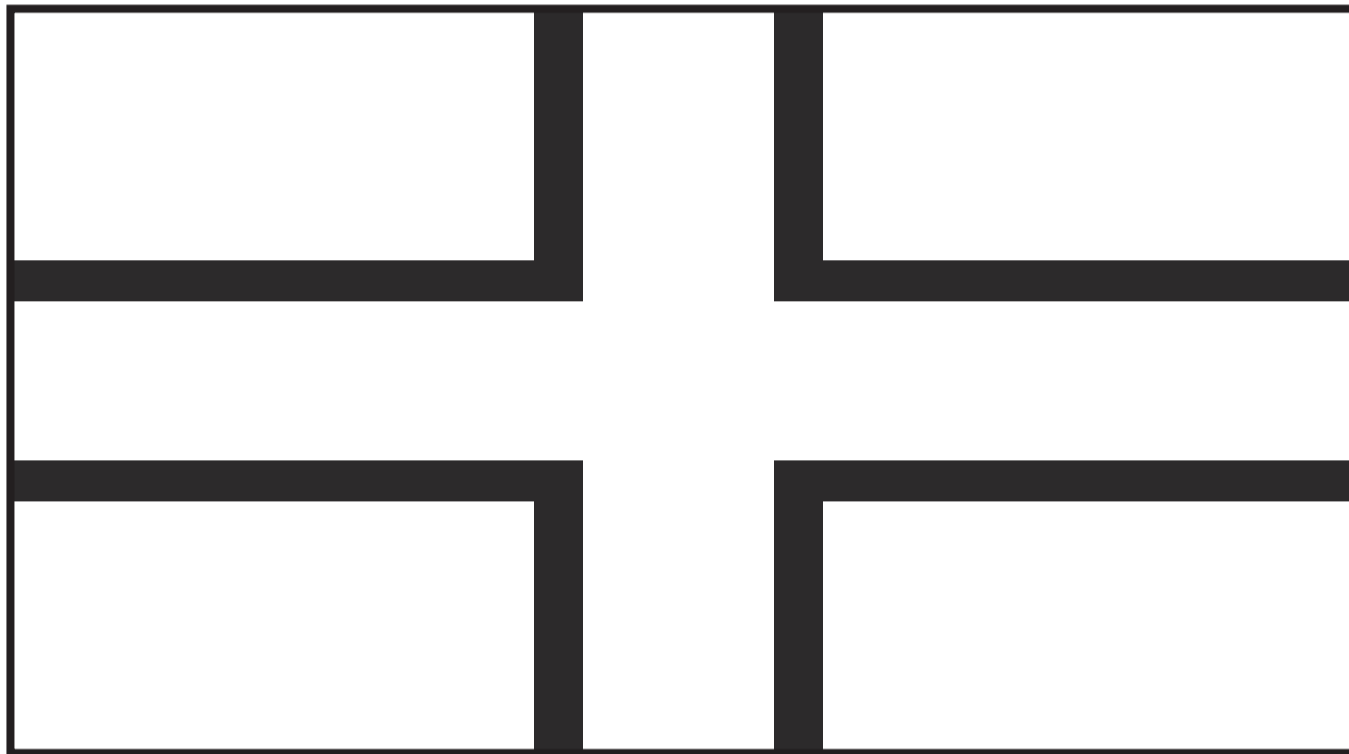
Question 9 (b)

Diagrams NOT drawn to scale

Large flag

120 cm

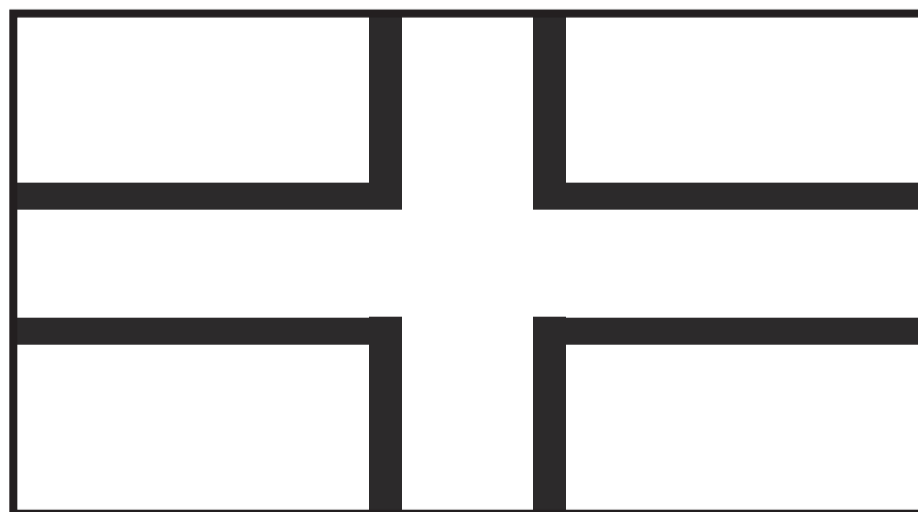
80 cm



Medium flag

Length

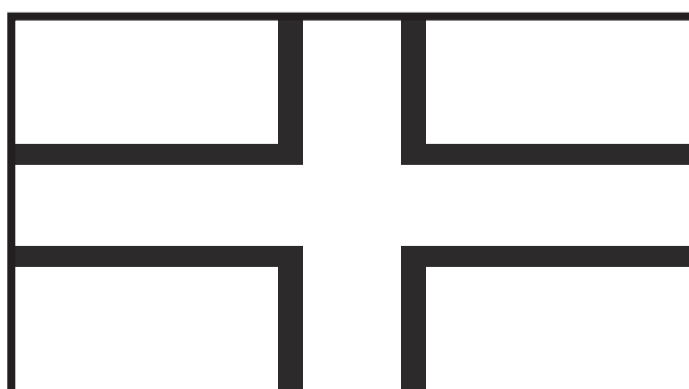
64 cm



Small flag

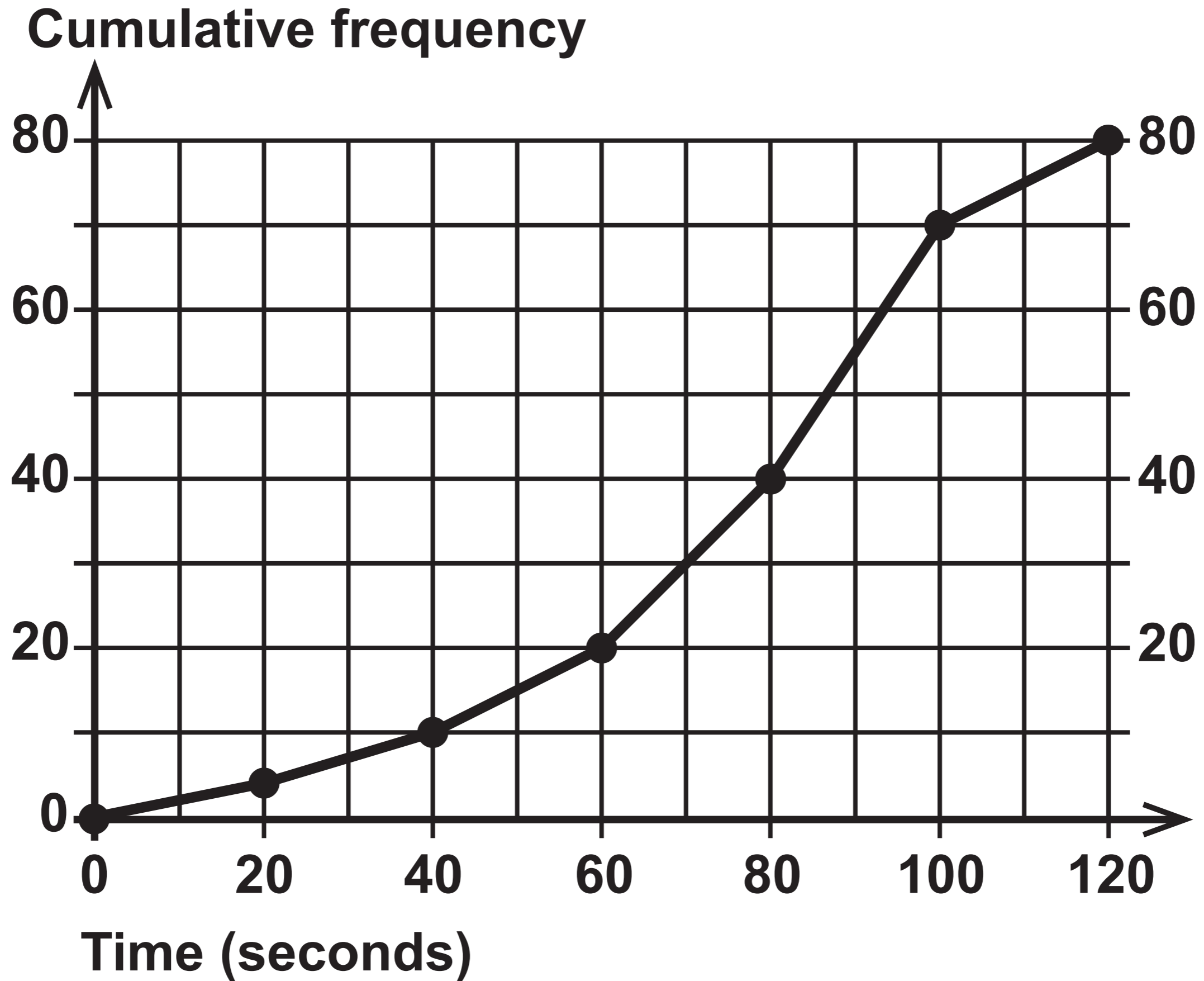
75 cm

Height



Question 10

NEW bird feeder



Question 10 (a)

ORIGINAL bird feeder	
Modal group	60 to 80 seconds
Median time	75 seconds
Interquartile range	20 seconds

Question 10 (c)

Variety of tree	Typical population density of grey squirrels PER km²
Oak	1200
Chestnut	100
Pine	45

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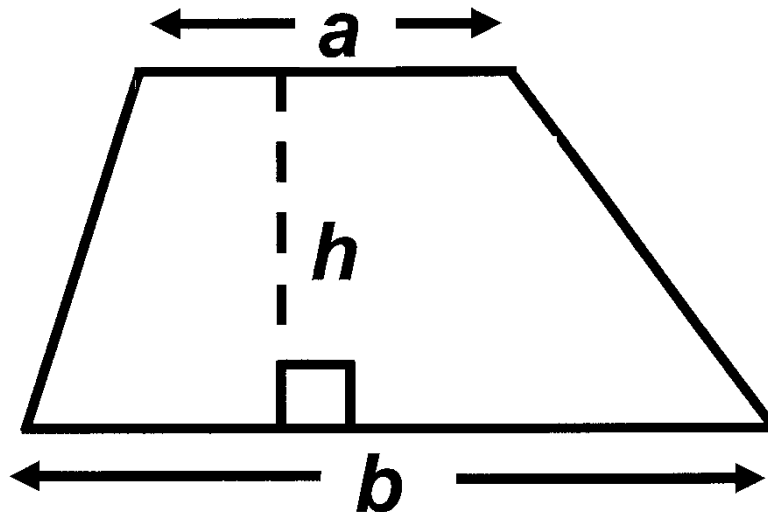
**FORMULA LIST
INTERMEDIATE TIER
GCSE**

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

