

Surname	Centre Number	Candidate Number
First name(s)		0



GCSE

3310U30-1



FRIDAY, 20 MAY 2022 – MORNING

**MATHEMATICS – NUMERACY
UNIT 1: NON-CALCULATOR
INTERMEDIATE TIER**

1 hour 35 minutes

ADDITIONAL MATERIALS

The use of a calculator is not permitted in this examination.
A ruler, a protractor and a pair of compasses may be required.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

You may use a pencil for graphs and diagrams only.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

If you run out of space, use the additional page at the back of the booklet. Question numbers must be given for the work written on the additional page.

Take π as 3.14.

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, the assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing.

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	4	
2.	5	
3.	3	
4.	6	
5.	8	
6.	3	
7.	8	
8.	6	
9.	5	
10.	2	
11.	6	
12.	4	
13.	10	
Total	70	

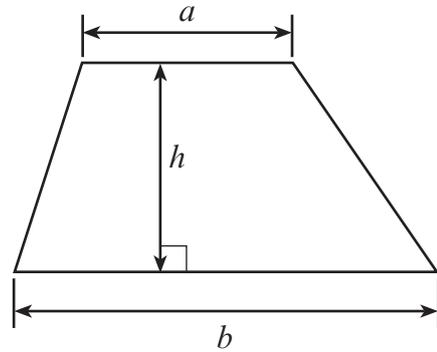
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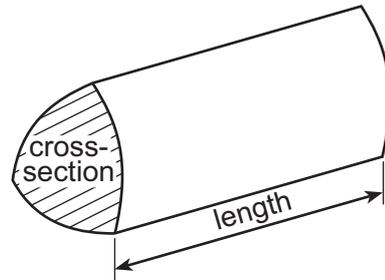
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Formula List – Intermediate Tier

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



Volume of prism = area of cross-section \times length



2. *In this question, you will be assessed on the quality of your organisation, communication and accuracy in writing.*

During the first 10 days of April, the mean daily rainfall in Gwentre was 1.8 cm.
On 11th April, the rainfall in Gwentre was 4 cm.

By finding the total rainfall for the first 10 days of April, calculate the mean daily rainfall for the first 11 days of April.
You must show all your working. [3 + 2 OCW]

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3. Apples cost £3 per kg.
Elsa buys some apples weighing a total of 200 g.
She pays with a £10 note.



Calculate how much change Elsa should get.
You must show all your working. [3]

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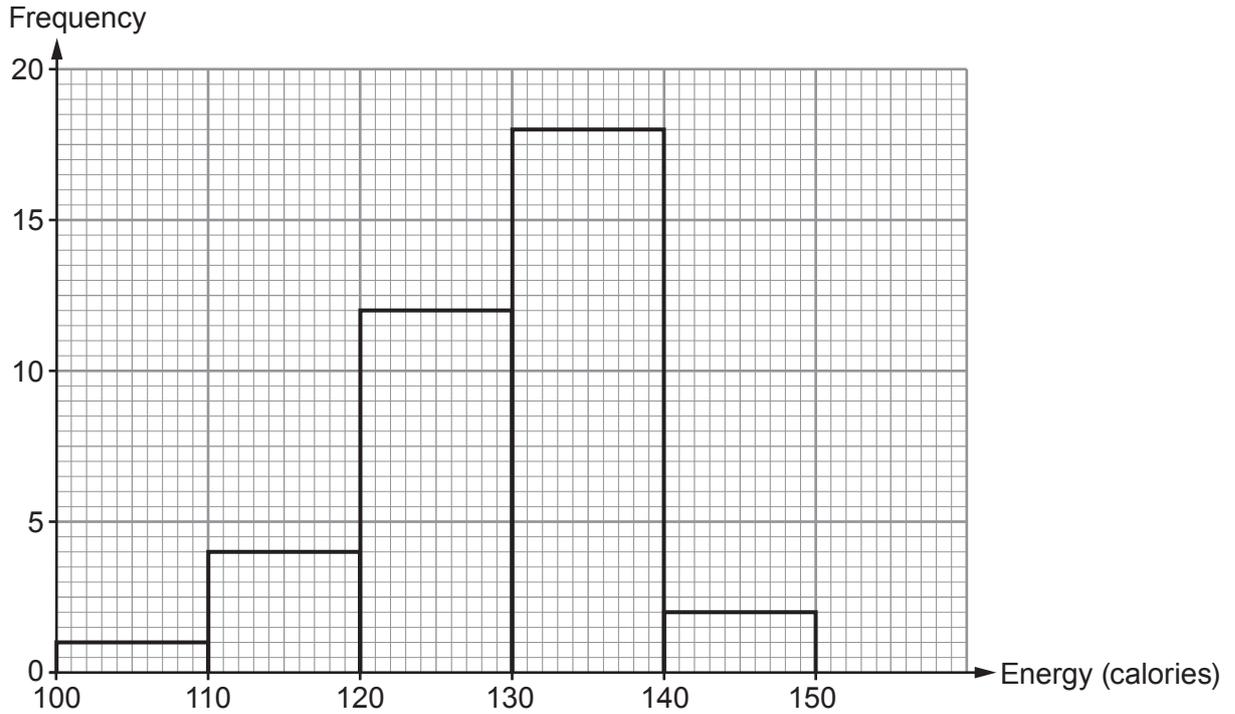
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4. Rodney records how much energy, in calories, different energy bars provide. Each energy bar has a mass of 35 g.

Rodney draws a frequency diagram to display his findings. He uses groups of width 10 calories:

$$100 \leq \text{energy} < 110, \quad 110 \leq \text{energy} < 120, \quad \dots, \quad 140 \leq \text{energy} < 150$$



- (a) Which is the modal group? [1]

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- (b) What fraction of the energy bars provide less than 130 calories? [3]

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- (c) Consider **only** the energy bars providing 130 calories or more. What percentage of these energy bars provide 140 calories or more? [2]

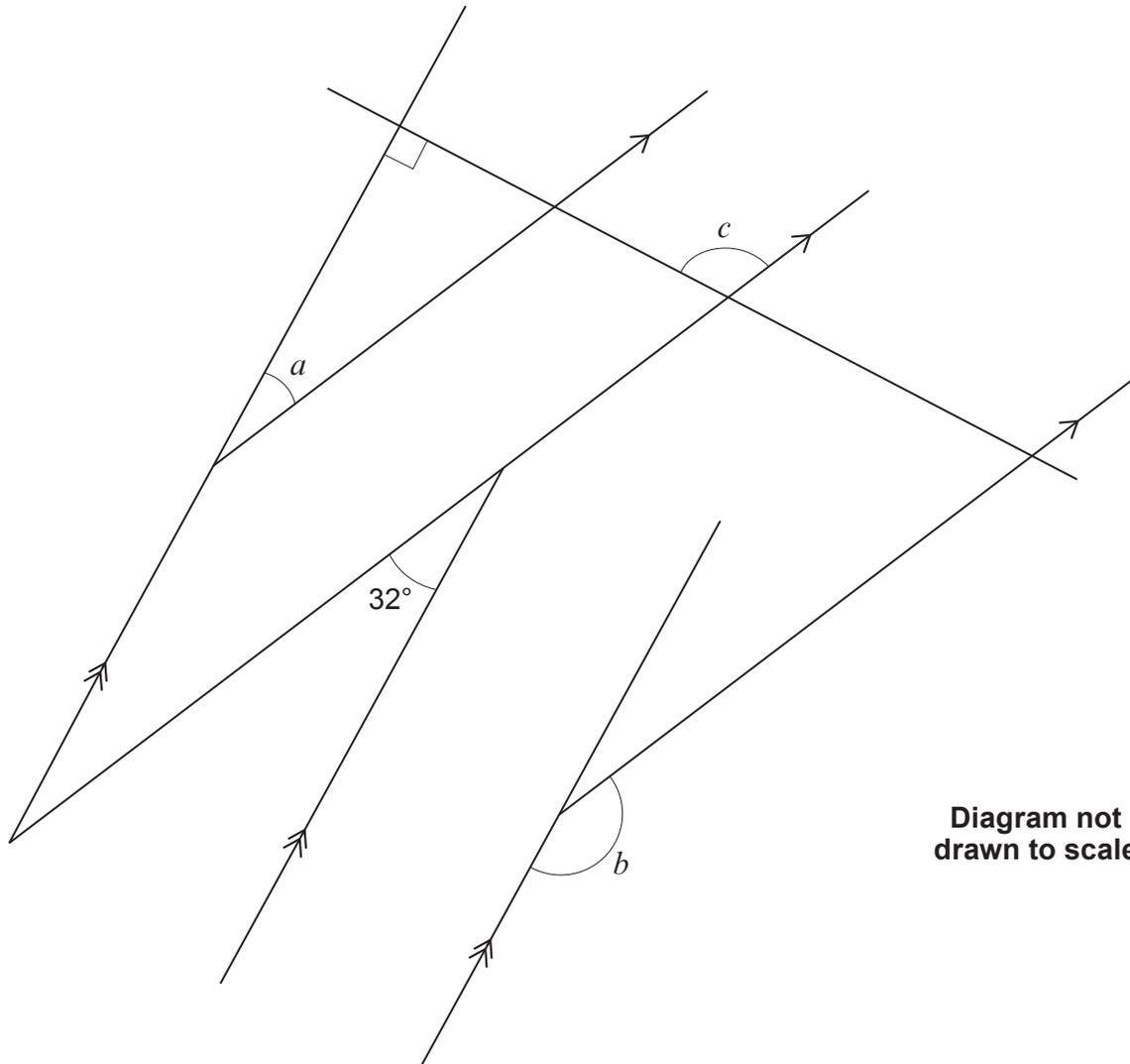
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6. Waintram Housing has a plan for building some new houses. The plan below shows the layout of the drains for some of the houses. Some of the angles still need to be found.



Find the size of each of the angles a , b and c .

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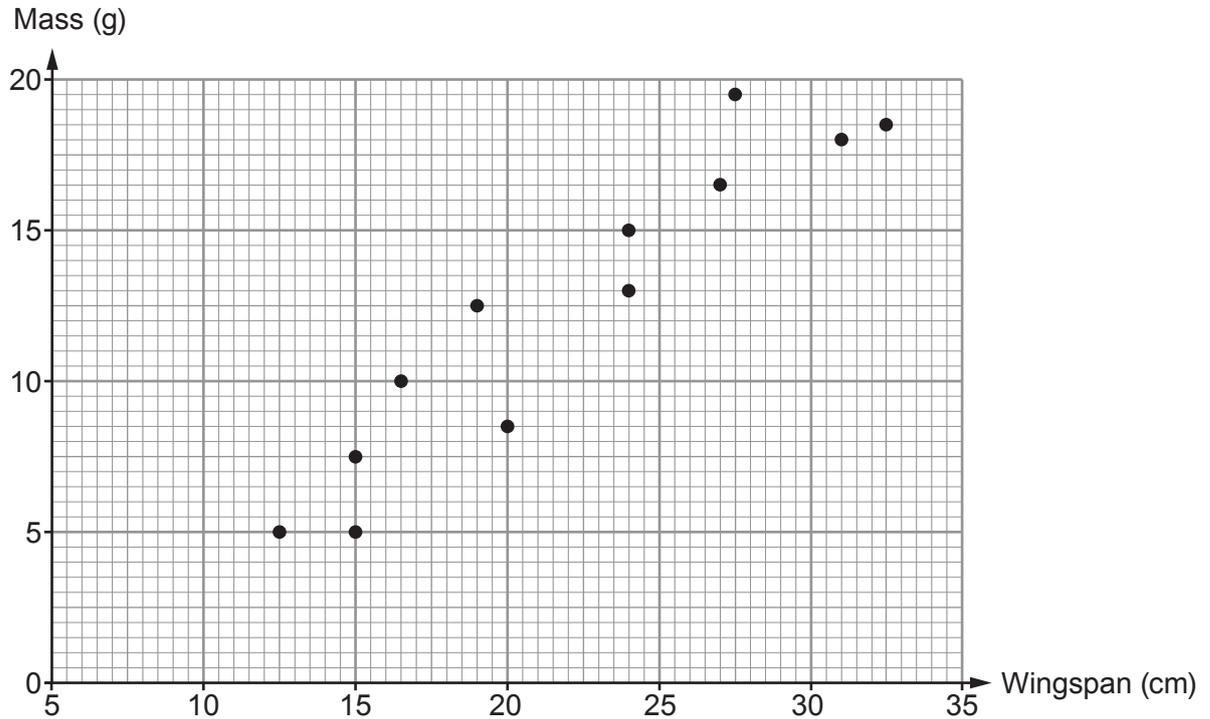
$a = \dots\dots\dots^\circ$

$b = \dots\dots\dots^\circ$

$c = \dots\dots\dots^\circ$



7. Myra recorded the wingspan and mass of a number of birds. Her results are shown in the scatter diagram below.



(a) The wingspan of one of the birds shown in the scatter diagram is 31 cm. What is the mass of this bird?

[1]

Mass is g

(b) Two of the birds shown in the scatter diagram have a mass of 5g. What is the difference between the wingspans of these two birds?

[2]

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 Difference between the wingspans is cm

(c) Use $30\text{ cm} \approx 12\text{ inches}$ to answer this question. Find the wingspan of the bird with a mass of 8.5g. Give your answer in **inches**.

[3]

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Wingspan is inches



(d) What type of correlation does this scatter diagram show? [1]

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(e) Use the scatter diagram to estimate the wingspan of a bird with a mass of 12g. [1]

Wingspan is cm

8. People travel by bus or by train from Hiraddug Station.
On Tuesday, 420 people travelled by bus from the station.

(a) Of the 420 people who travelled by bus from the station, 35% had a travel pass.
Calculate the number of people who travelled by bus and did **not** have a travel pass. [3]

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(b) On Tuesday, the ratio of the number of people travelling by bus to the number of people travelling by train was 20 : 17.
Calculate the number of people who travelled by train from the station on Tuesday. [3]

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9. (a) Gwyn is making some packs.
Each pack contains one nut, one bolt and one washer.



To make up these packs, Gwyn buys:

- some boxes that contain 30 nuts each
- some boxes that contain 5 bolts each
- some boxes that contain 25 washers each.

Gwyn wants to buy the **least possible number of boxes** so that, in making up the packs, he uses **all** of the nuts, bolts and washers he has bought.

Complete the table below to show the number of boxes of each item that Gwyn needs to buy.

You must show all your working.

[3]

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		Number of boxes needed
	Nuts (30 in each box) boxes
	Bolts (5 in each box) boxes
	Washers (25 in each box) boxes

- (b) Each washer has a thickness of 2 mm, correct to the nearest 0.5 mm.
Calculate the greatest possible thickness of a stack of 6 washers.

[2]

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10. The surface area of the Earth is 510 million km^2 .
Write this area in standard form.

[2]

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..... km^2



11. OrenVit is a company that produces bottles of orange juice. The company uses only bottles with a capacity of one litre.

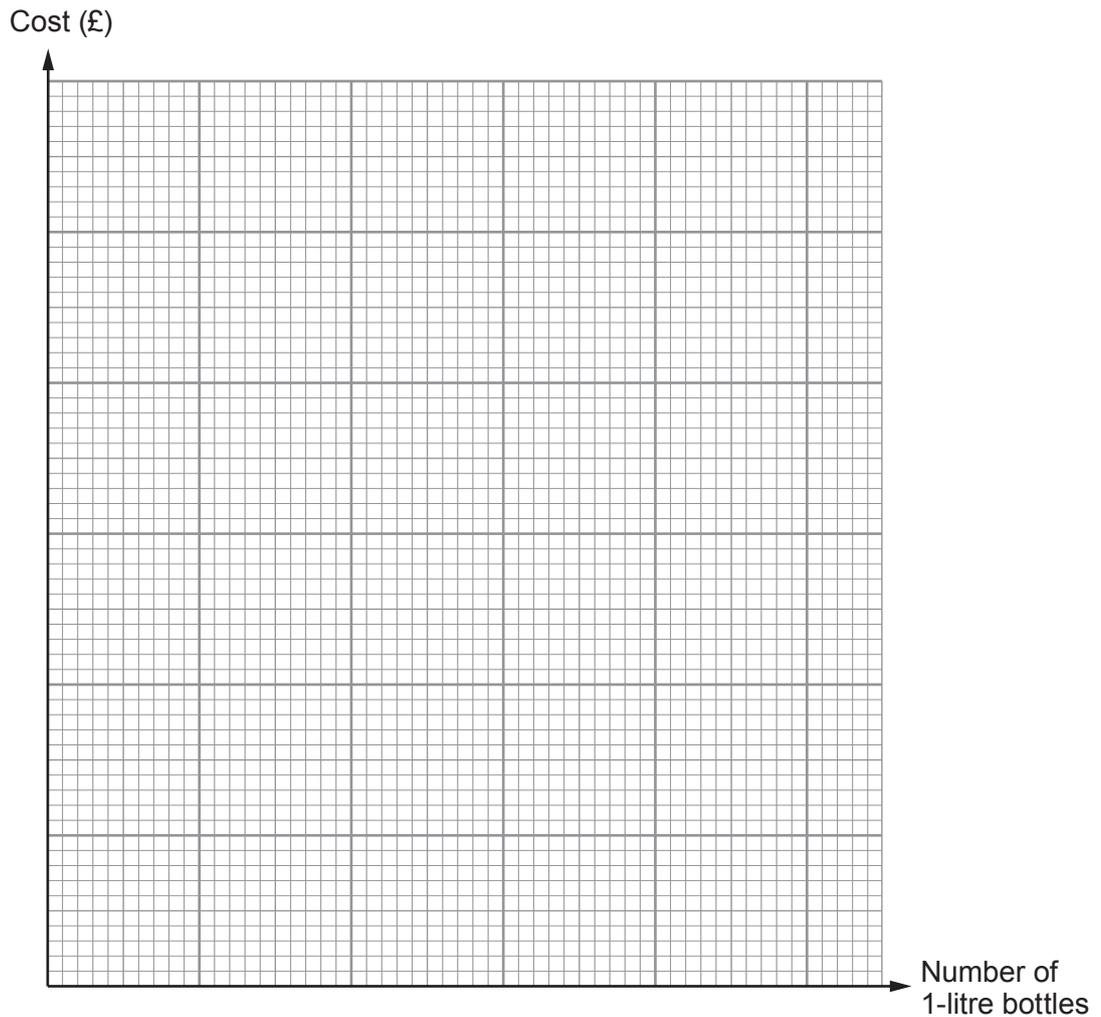
Each day, the cost of producing bottles of orange juice is as follows:

Fixed charge for use of equipment	£10
Cost of ingredients	80p per bottle
Cost of empty bottles with labels	20p per bottle

- (a) Draw a graph to show the total daily cost of producing between 0 and 100 bottles of orange juice. Use the graph paper below. [3]

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(b) One day, OrenVit produces 1750 pints of orange juice in one-litre bottles. Calculate the cost of producing this quantity of orange juice.

[3]

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12. Rectangular stickers with warnings written on them are often placed near water taps.

The rectangular sticker shown below warns of hot water. It has a length of 14 cm and an area of 42 cm².



This water is hot

Diagram not drawn to scale

The sticker below is mathematically similar to the first sticker. It is an enlargement of the first sticker, with scale factor 4.

This water is hot

Diagram not drawn to scale

Calculate the length and the width of the larger sticker. You must show all your working.

[4]

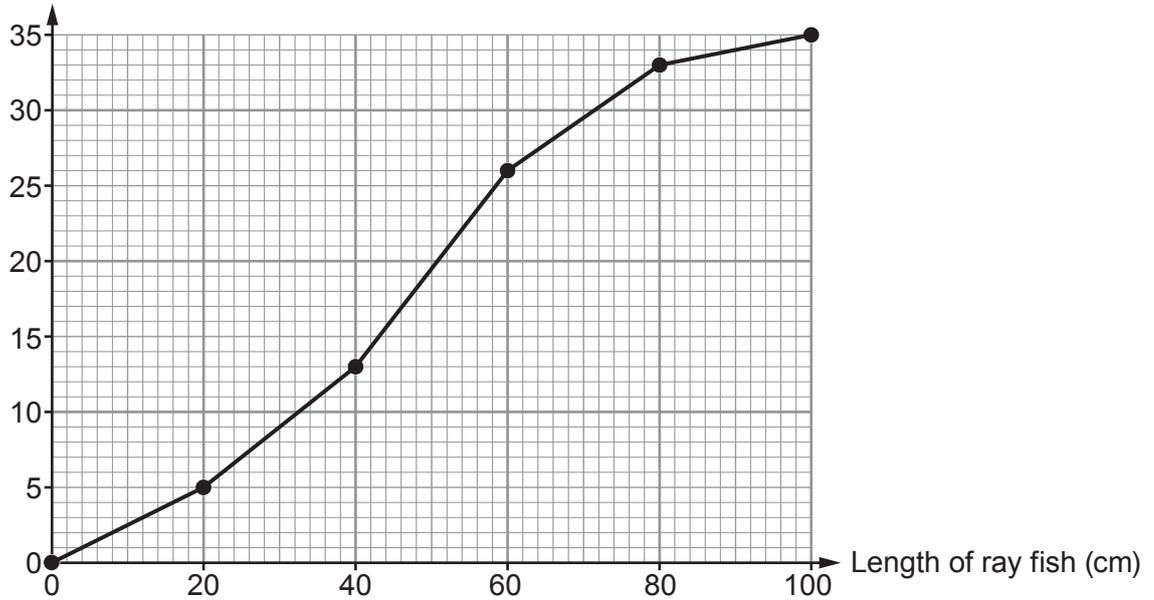
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13. (a) An aquarium has 35 ray fish. The cumulative frequency graph shows information about the lengths of these ray fish.



Cumulative frequency



Use the cumulative frequency diagram to give the best estimates for the answers to the following questions.

- (i) What is the median length of these ray fish? [1]

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 cm

- (ii) How many of these ray fish have lengths greater than 72 cm? [1]

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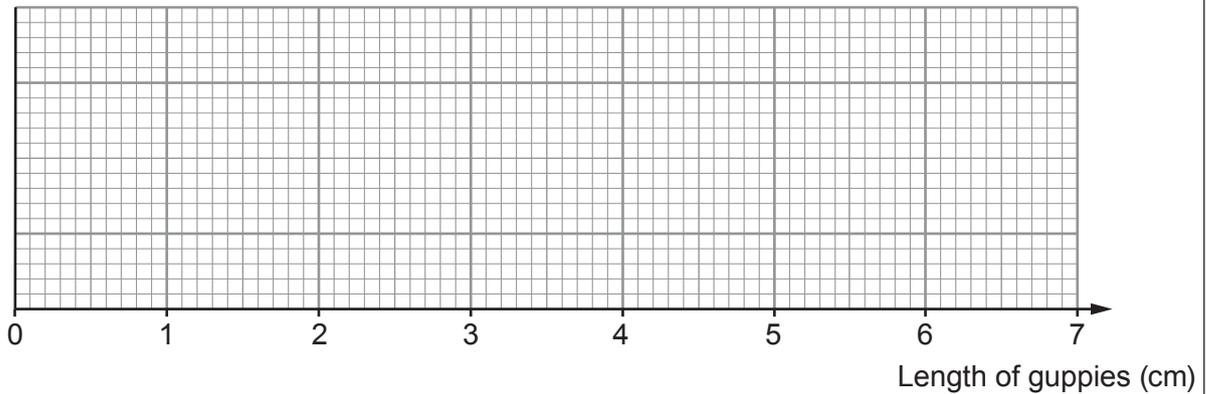
- (b) The aquarium also has guppies.
The table shows information about the length of the guppies in a sample of 60 guppies.



Minimum	Range	Median	Lower quartile	Interquartile range
1.6 cm	5.2 cm	3.2 cm	2.4 cm	3.4 cm

- (i) Draw a box-and-whisker plot of this data on the grid below.

[4]



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- (ii) How many of the sample of 60 guppies have a length greater than or equal to 2.4 cm?

[2]

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- (c) A carp was weighed in November 2021.
It was weighed again in April 2022.
The carp had a mass of 9.9 kg in April 2022.
Between these dates, the mass of the carp increased by 10%.
Calculate the mass of the carp in November 2021.



[2]

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