Surname	Centre Number	Candidate Number
First name(s)		0

GCSE

3310U30-1

A23-3310U30-1

TUESDAY, 7 NOVEMBER 2023 – MORNING

MATHEMATICS – NUMERACY
UNIT 1: NON-CALCULATOR
INTERMEDIATE TIER

1 hour 45 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** questions.

Write your answers in the spaces provided in this booklet. If you run out of space, use the additional page(s) at the back of the booklet, taking care to number the question(s) correctly.

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 **4**(a), 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.	**6**	
2.	**7**	
3.	**14**	
4.	**10**	
5.	**5**	
6.	**9**	
7.	**4**	
8.	**6**	
9.	**11**	
10.	**4**	
11.	**4**	
Total	**80**	

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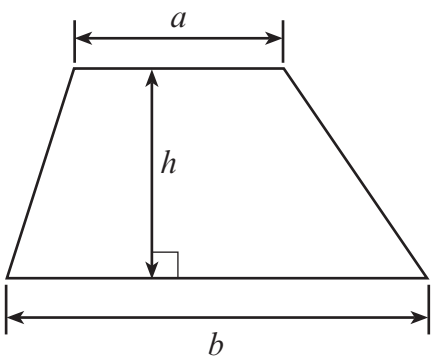
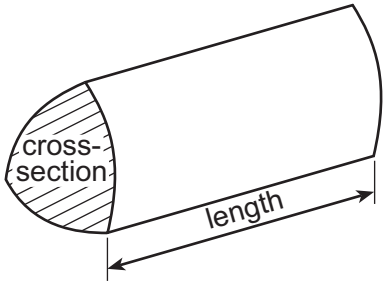
Formula List – Intermediate Tier

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



Volume of prism = area of cross-section × length



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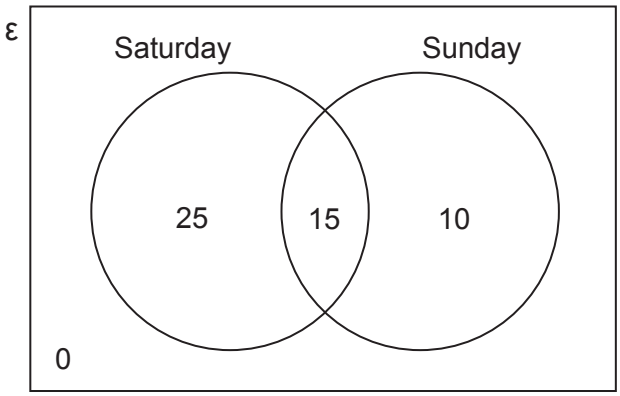
1. Delyth buys 50 tickets for a group of friends to go to a music festival.
The ticket prices are given below.

Ticket for	Ticket price per person
Saturday only	£20
Sunday only	£17
Both days	£28

The Venn diagram below shows the number of tickets that Delyth buys.



(a) What fraction of the group has tickets for both days?
Give your answer in its simplest form. [2]

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(b) Calculate the total cost of the 50 tickets.
You must show all your working. [4]

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Total cost of the 50 tickets is £ .....

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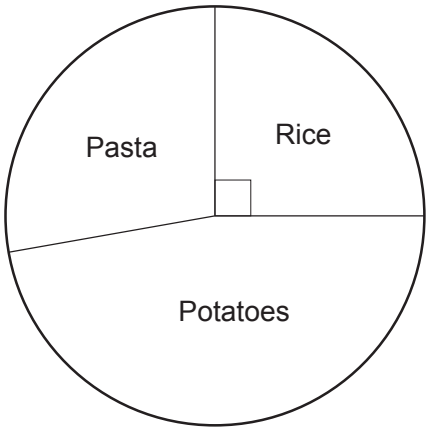
2. In a survey, 540 people were asked if they preferred pasta, rice or potatoes.
They were asked to choose just one preference.
The results are displayed in the accurately-drawn pie chart below.



(a) How many people preferred rice? [2]

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..... people

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(b) The sector for potatoes on the pie chart is to be split.
40% of the people who chose potatoes said they preferred chips.

What will be the size of the angle in the sector for **chips**?
You must show all your working. [3]

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(c) 540 people took part in the survey. $\frac{7}{10}$ of these people were children..
How many people who took part in the survey were **not** children? [2]

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Number of people who were **not** children .....

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3. (a) Tomos uses the recipe below to make mushroom risotto.
This recipe serves 4 people.

Mushroom Risotto serves 4 people

400 g mushrooms
8 spring onions
25 g butter
200 g rice
1 litre stock
50 g cheese

(i) How many **cm^3** of stock would Tomos need to make mushroom risotto for 10 people? [3]

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..... cm^3 of stock

(ii) How many **kilograms** of rice would Tomos need to make mushroom risotto for 48 people? [2]

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..... kg of rice

(iii) Write the ratio of the quantities of butter to rice to cheese in its simplest form. [2]

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butter : rice : cheese = ... : ..... : .....

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(iv) Tomos wants to estimate, **in ounces**, the mass of the mushrooms he would need to make risotto for 4 people.
He knows that 1 ounce ≈ 28 grams.

Calculate an estimate for the mass of mushrooms, in ounces, that Tomos needs.
You must show all your working. [2]

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(b) The table below shows the amount of nutrition in one serving of mushroom risotto.

Nutrition per serving					
Fat	Carbohydrates	Sugars	Fibre	Protein	Salt
15 g	37 g	6 g	5 g	14 g	1 g

(i) A serving of mushroom risotto gives $\frac{1}{6}$ of the maximum amount of salt recommended per day for anyone aged 11 or older.

What is the maximum amount of salt recommended per day for anyone aged 11 or older?
Circle your answer. [1]

1 g 5 g 6 g 10 g 60 g

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(ii) The formula below gives the daily recommended mass of protein.

Mass of protein in **grams** = 0·8 × body mass in kg

Tomos has a body mass of 70 kg.
What **percentage** of his daily recommended mass of protein is there in one serving of mushroom risotto? [4]

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4. (a) *In this part of the question, you will be assessed on the quality of your organisation, communication and accuracy in writing.*

Rita gives some money to charity.
She decides to share this money between 3 different charities.

Rita gives $40 to a children's charity.
This is $\frac{1}{5}$ of the total amount of money she gives to the 3 charities.
Rita gives $\frac{1}{4}$ of the total amount of money to an animal charity.

She gives the remaining money to a medical research charity.
Calculate how much money Rita gives to the medical research charity.
You must show all your working. [5 + 2 OCW]

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(b) Last year, Rita's total income before tax was $30 000.

No income tax was payable on any income below $10 000.
Income tax had to be paid at a rate of 22% on any income between $10 000 and $30 000.

How much income tax did Rita pay last year? [3]

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5. The map below shows part of South West Wales.

(a) Find the bearing of St Brides from Fishguard. [1]

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(b) The distance by road from Haverfordwest to Milford Haven is 12 km.

(i) Estimate the distance by road from Haverfordwest to Fishguard. [1]

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..... km

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(ii) Owain has a **different** map that has a scale of 1 : 25000.

Owain measures the distance by road from Haverfordwest to Milford Haven on his map.
Complete Owain's statement below.

"On my map, the distance by road from Haverfordwest to Milford Haven is represented by a length of ..... cm." [3]

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6. Rhodri is organising a 21st birthday party.

(a) Confetti for the party is packed in small boxes.
Each box is in the shape of a triangular prism.
The cross-section of each box is an isosceles triangle.
The measurements are shown on the diagram below.

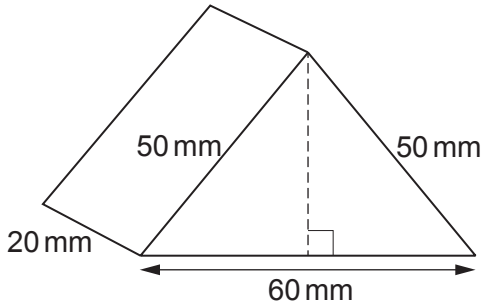

Diagram not drawn to scale

(i) Show that the perpendicular height of the cross-section of a confetti box is 40 mm.
You must show all your working. [3]

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(ii) This is the label on a confetti box.

The volume of this box is at least 20000 mm^3.

Calculate the volume of a confetti box to show that the statement on the label is correct. [3]

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(b) Rhodri finds 2 venues that arrange party nights.

Friar Hall Party night special £105 hall hire charge + £5 per person		**Minfelin Lodge** Party night special £207 room hire charge + £3 per person

Rhodri calculates the total cost of organising the party at each venue.
He finds that the total costs are the same.
For how many people is Rhodri planning the 21st birthday party?
You must show all your working. [3]

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7. A supermarket sells 2 varieties of washing powder: Dazzle and Sparkle.
Both washing powders are sold in 3·3 kg packets.
The ratio of the prices of the washing powders is as follows.

Dazzle : Sparkle = 9 : 10

The price of a 3·3 kg packet of Sparkle is £4.40.

Calculate the **cost per kilogram** of Dazzle.
You must show all your working. [4]

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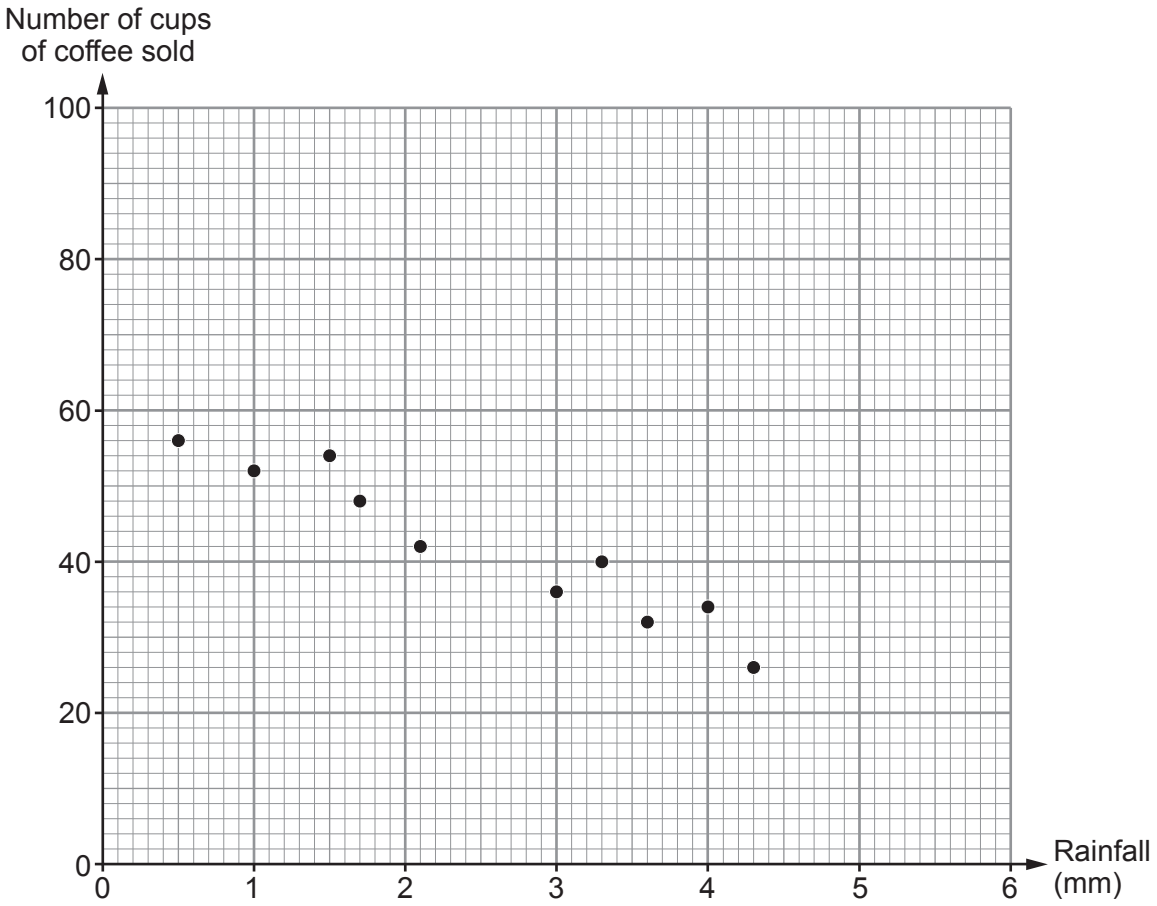
8. Anwen has an outdoor mobile coffee stall.

(a) It rained on each of the last 10 days.
Each day, Anwen recorded the amount of rainfall and the number of cups of coffee she sold.
The scatter diagram below shows her results.



For the last 10 days:

- the mean number of cups of coffee sold per day was 42
- the **total** rainfall was 25 mm.

(i) Give the coordinates of the point through which a line of best fit should be drawn.
Hence, draw a line of best fit on the scatter diagram. [2]

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Coordinates of the point are (..... , ...)

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(ii) Estimate the number of cups of coffee that Anwen expects to sell on a day when the rainfall is 2·0 mm.
Use your line of best fit to find your estimate. [1]

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Number of cups of coffee is .....

(b) Anwen buys her coffee beans in tins.
Each tin has a height of 18 cm, correct to the nearest 1 cm.

Calculate the maximum height of a stack of 5 of these tins. [2]

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(c) The height of the storage space under Anwen's serving counter is 97·5 cm, correct to the nearest 0·5 cm.

Anwen is going to buy a recycling bin of height exactly 97·3 cm.
Can Anwen be certain that she can fit this bin under her serving counter?

Yes ☐ No ☐ Can't decide ☐

You must show working to support your answer. [1]

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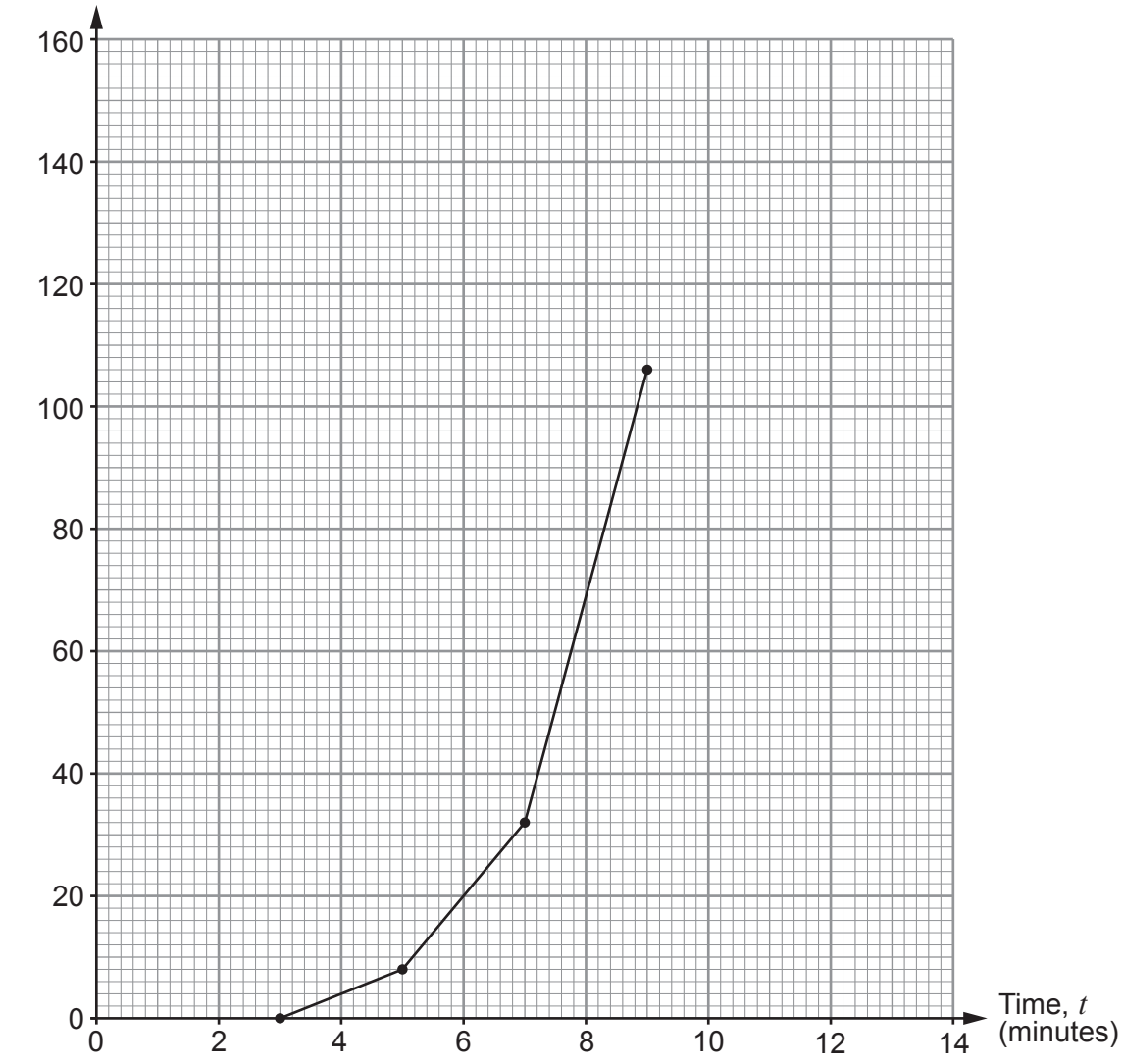
9. Giovanni has a takeaway pizza van. He sells whole pizzas and slices of pizza from his van.

(a) For the last 3 days, he has timed how long it takes to complete the food order for each of his customers.
Giovanni recorded his results in the table below.

(i) Complete the cumulative frequency table **and** the cumulative frequency diagram. [2]

Time, t (minutes)	Frequency	Cumulative frequency
$3 < t \leqslant 5$	8	8
$5 < t \leqslant 7$	24	32
$7 < t \leqslant 9$	74	106
$9 < t \leqslant 11$	40	.....
$11 < t \leqslant 13$	14	.....



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

(ii) Find the median time taken to complete a food order. [1]

The median time is ..... minutes.

(iii) Giovanni is concerned that food orders are taking too long to complete.
He says,

"Only 25% of the food orders are completed in under ..... minutes."

Use **one** of the five values below to complete Giovanni's statement. [1]

6·4 6·6 7·2 8 9·6

(iv) Calculate the percentage of orders that were completed in less than 6 minutes. [2]

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(b) For the last 3 days:
- Giovanni spent £180 on ingredients
- he spent £220 on the running costs for the pizza van
- he received a total of £700 from the food orders.

Calculate Giovanni's percentage profit. [3]

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(c) Next year Giovanni intends to charge £8.40 for a basic pizza.
This is an increase of 20% from the current charge.

Calculate how much Giovanni currently charges for a basic pizza. [2]

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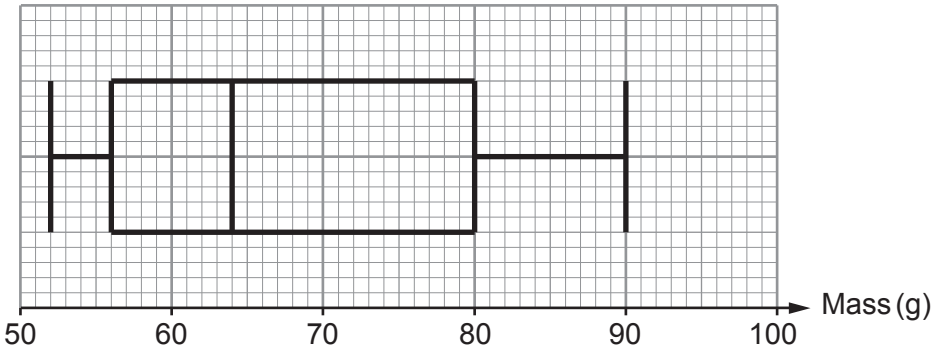
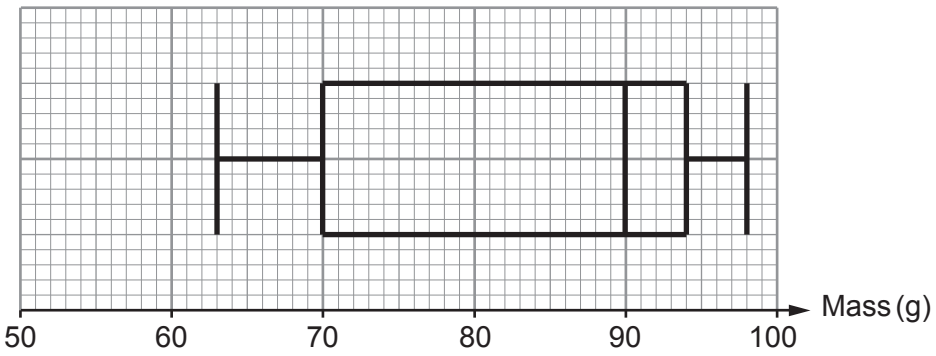
10. Eva grows three varieties of organic potato on her farm: Maris Piper, King Edward and Desiree.
She weighs and records the masses of 400 potatoes of each of the 3 varieties.

Eva constructs box-and-whisker diagrams for the masses of the potatoes weighed.

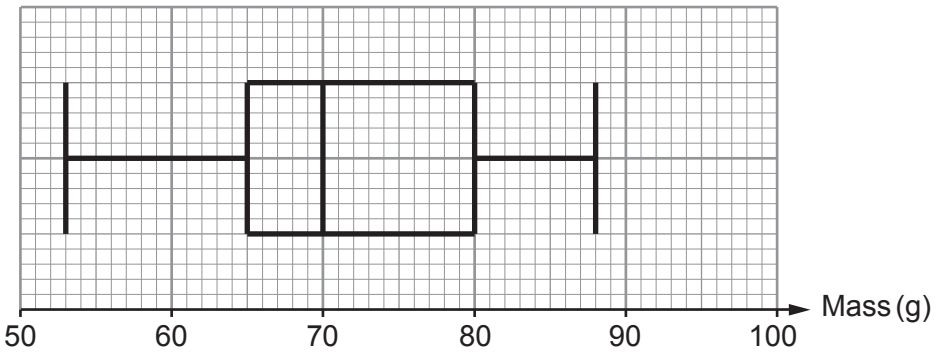
Maris Piper



King Edward



Desiree



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(a) Complete each of the following statements.

(i) The ..... potatoes have the highest median mass.

The median mass of these potatoes is ..... g. [1]

(ii) The range of the masses recorded for the Maris Piper potatoes is ..... g. [2]

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(b) In the future, Eva wants to grow potatoes that are quite similar in size.

Use the box-and-whisker diagrams to advise Eva which of these three varieties of potato she should grow. [1]

Select which variety of potato she should grow.

Maris Piper ☐ King Edward ☐ Desiree ☐

Select the measure you used to help you decide.

Median ☐ Interquartile range ☐ Lower quartile ☐

Select a reason for your choice of measure.

The measure is greater than for the other 2 varieties ☐

The measure is less than for the other 2 varieties ☐

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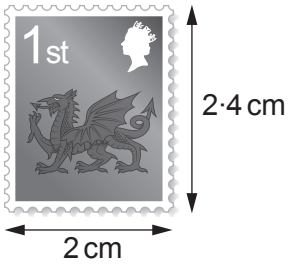
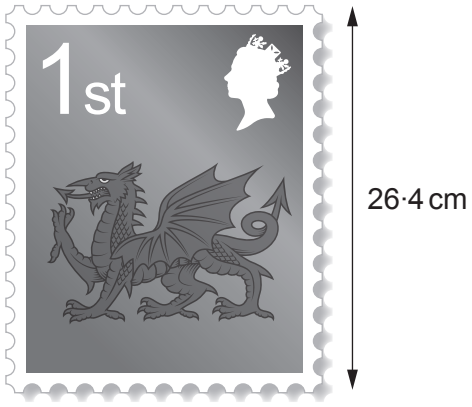
11. An old postage stamp has a width of 2 cm and a height of 2·4 cm.
Frank makes a poster that is **mathematically similar** to the postage stamp, as shown below.

Postage Stamp



Poster



Diagrams not drawn to scale

He places a thin tape along the four edges of the poster.
Calculate the total length of this tape, correct to 1 significant figure.
You must show all your working. [4]

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