

Print copy of Braille text (UEB)

WJEC GCSE

3310U50-1

Mathematics – Numeracy

Unit 1: Non-Calculator

Higher Tier

Thursday 8 May 2025 – Morning

1 hour 45 minutes **plus your additional time allowance**

ADDITIONAL MATERIALS

You must have: Tactile ruler and protractor, pair of compasses and drawing equipment e.g. geometry board, rubber mat, mapping pins, rubber bands, drawing stylus and spur wheel.

ITEMS INCLUDED WITH QUESTION PAPER

- **A separate Formula List.**
- **A separate Diagram Booklet.**
- **Models for Question 8, Question 13 (b) and Question 13 (c).**
- **Sticky labels for Question 1**
- **Wikki Stix for Question 12 (b) (ii).**

INSTRUCTIONS TO CANDIDATES

- **On your paper**, write your name, centre number and candidate number.
- Answer ALL the questions **on your paper**.
- The use of a calculator is NOT permitted in this examination.
- 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.

1. Look at the diagram for Question 1 in the separate Diagram Booklet.
The diagram IS drawn to scale.

The scale drawing shows a plan of a stage in a theatre.

The stage measures 20 metres by 12 metres.

The scale used is 1 cm REPRESENTS 1 metre.

An 'X' will be marked on the stage where a microphone is to be placed.

The 'X' must be:

- equidistant from the front of the stage and the right wing
- 4 metres from the front of the stage.

Draw suitable lines on the plan and show where the 'X' will be marked.

A spare tactile diagram, sticky label X and drawing film are provided for this question. [3 marks]

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

Nadya borrowed £500 from a loan company.

The loan company told her that she would pay more than 100% interest.

Nadya paid off the loan and interest completely by paying back £55 each month for 2 years.

What percentage interest did Nadya actually pay?

You must show all your working.

Ans: ____ [4 marks + 2 marks OCW]

3. Last year, Jade's total income before tax was €20,000

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

Band: Personal allowance

Taxable income: Up to €10,000

Tax rate: 0%

Band: Basic rate

Taxable income: €10,000 to €18,000

Tax rate: 10%

Band: Higher rate

Taxable income: Over €18,000

Tax rate: 20%

Calculate Jade's TOTAL tax bill last year.

You must show all your working.

Ans: ____ [4 marks]

4. When Hassan has a bath, he fills it with 30 gallons of water.

When Hassan has a shower, water flows from his shower at a rate of 0.2 litres per second.

Hassan uses the same amount of water whether he has a bath or a shower.

How long does he spend in the shower?

Give your answer in minutes and seconds.

You must show all your working.

Use: 1 gallon $\approx$ 4.5 litres

Ans: Time in the shower is ____ minutes ____ seconds [6 marks]

5. Dafydd and Mia both play musical instruments.

(a) Dafydd and his mum share the cost of buying a saxophone in the ratio 3:7
His mum's share of the cost is £280

How much will this saxophone cost to buy?

Ans: ____ [3 marks]

(b) Mia takes her violin to be valued every year.

This year, it is valued at £660

The violin has increased in value by 20% from last year.

Calculate how much Mia's violin was worth last year.

Ans: ____ [2 marks]

6. Kendrick Nurseries grow tomatoes to sell to supermarkets.

They grow three varieties: Sungold, Roma and San Marzano.

The head gardener recorded the mass of tomatoes from each of 500 plants for each of the three varieties.

Look at the diagram for Question 6 in the separate Diagram Booklet.
The diagram shows three box and whisker diagrams.

The box-and-whisker diagrams show the masses of the tomatoes for
Sungold, Roma and San Marzano.

(a) What is the range of the masses for the Sungold tomato plants?

Ans: Range is ____ kg [1 mark]

(b) How many of the Roma plants produced 25 kg or less of tomatoes?

Ans: ____ plants [2 marks]

(c) The box-and-whisker diagrams show that two of the varieties have the same lower quartile mass.

Which one of these two varieties produces tomatoes that seem to have a more consistent mass?

Ans: Variety of tomato is ____

Which one of these measures could you use to help you decide?

Choose your answer from the following list:

S = Mode

T = Median

U = Mean

V = Interquartile range

W = Greatest mass

Ans: ____ [1 mark]

7. Look at the diagram for Question 7 in the separate Diagram Booklet.

The diagram is NOT drawn to scale.

The diagram represents Davina's garden labelled ABCD.

In the diagram:

AB = 600 cm

AD = 400 cm

DC = 900 cm

AB is parallel to DC

Angle ADC is a right angle.

(a) Davina wants to put a 5 cm layer of topsoil on her garden.

What volume of topsoil will Davina need for her garden?

Give your answer in cm^3 in STANDARD FORM.

Ans: ____ [5 marks]

(b) Topsoil is sold in $1.5 \times 10^4 \text{ cm}^3$ bags.

Calculate the number of bags of topsoil that Davina needs to buy.

You must show all your working.

Ans: ____ [1 mark]

8. A solid triangular prism is placed along the bottom of a door to stop draughts.

Ask for the model for Question 8

The model is NOT made to scale.

The model represents the solid triangular prism with the end face labelled ABC.

Look at the diagram for Question 8 in the separate Diagram Booklet.

The diagram is NOT drawn to scale.

The diagram shows the end face of the prism.

In the diagram:

$AB = 4 \text{ cm}$

$BC = 3 \text{ cm}$

$AC = 5 \text{ cm}$

Angle ABC is a right angle.

The length of the triangular prism is equal to the width of the door.

The volume of the triangular prism is 546 cm^3

Calculate the width of the door.

You must show all your working.

Ans: ____ [3 marks]

9. Look at the diagram for Question 9 in the separate Diagram Booklet.

The diagram is a cumulative frequency diagram.

Aled is a gardener.

In April, he records how many minutes he spends working in each of his customers' gardens.

He draws **this** cumulative frequency diagram to display the findings.

(a) Find the median time that Aled spends working in the garden for these customers.

Ans: Median is ____ minutes [1 mark]

(b) For how many customers did Aled spend between 10 and 30 minutes working in their garden?

Ans: ____ customers [1 mark]

(c) For 70% of his customers, Aled thinks that he spends less than 40 minutes working in their garden.

Is Aled correct?

You must show all your working.

Choose Aled is correct OR Aled is not correct

Ans: ____ [3 marks]

10. (a) In 2020, red squirrels were introduced into a woodland in Wales.

The following formula is used to calculate how many red squirrels there are in the woodland,

$$R = 200 \times 1.1^t$$

where:

- R is the number of red squirrels in the woodland
- t is the number of years after the red squirrels were introduced.

(i) How many red squirrels were introduced in 2020?

Ans: ____ [1 mark]

(ii) Calculate the PERCENTAGE increase in the number of red squirrels 2 years after they were introduced.

Ans: ____ [3 marks]

(b) Workers are making a new area of woodland.

4 workers planted 15,000 trees in 3 days.

How many workers will be needed to plant another 17,500 trees in 2 days?

You can assume that all workers plant trees at the same rate.

Ans: ____ [3 marks]

11. Harri and Alys are learning about diluting liquids.

They mix 300 ml of water with 200 ml of acetic acid to make 500 ml of diluted acetic acid.

Water has a density of 1 g/ml.

Acetic acid has a density of 1.05 g/ml.

Calculate the density of the diluted acetic acid that Harri and Alys have made. Give your answer as a decimal.

Ans: Density of the diluted acetic acid is ____ g/ml [4 marks]

12. (a) Afan is an online company that employs 400 staff in four different job types.

The table below shows the total number of staff in each job type.

Job type	Number of staff
Management	39
Office	82
Warehouse	227
Delivery	52

Afan wants to carry out a survey of its staff to find out about staff well-being. The survey will be given to a sample of 100 staff.

Use stratified sampling to calculate the number of staff from each job type who should be asked to complete the survey on the next page. You must show all your working.

Job type	Number in sample
Management	(i)
Office	(ii)
Warehouse	(iii)
Delivery	(iv)

Ans: (i) ____ (ii) ____ (iii) ____ (iv) ____ [4 marks]

(b) The youngest member of staff is aged 20, and the oldest member of staff is aged 69

Look at the diagram for Question 12 (b) in the separate Diagram Booklet. The diagram is a histogram.

The histogram shows the ages of some of Afan's staff.

(i) How many staff does the histogram currently show?

Ans: ____ [2 marks]

(ii) Afan employs a total of 400 staff.

The bar for the group $45 \leq \text{age} < 55$ is missing from the histogram. Complete the histogram.

A spare tactile diagram, Wikki Stix and drawing film are available for this question.

Ans: ____ [2 marks]

(iii) Use the histogram to calculate an estimate of the lower quartile of the ages of Afan's staff.

Ans: ____ [3 marks]

(iv) Sunila is a member of Afan's staff.

Sunila says,

"I am 27 years old. I think I'm in the lowest 25% of the ages of Afan's staff."

Is Sunila's age in the lowest 25%?

Choose either Yes OR No OR Can't tell

Ans: ____

Give a reason for your answer.

Ans: ____ [1 mark]

13. Pizza-Rea is a company that makes outdoor pizza ovens.

(a) Look at the diagrams for Question 13 (a) in the separate Diagram Booklet. There are three diagrams. Diagram 1 and Diagram 2 are NOT drawn to scale.

Diagram 1 shows the design for the metal front plate of Pizza-Rea's latest pizza oven.

The front of the oven is symmetrical.

It has a rectangular hole, through which pizzas are placed in the oven.

Pizza-Rea wants to calculate an estimate of the area of the metal used for this front plate.

Diagram 2 is a sketch of the front plate of the pizza oven drawn on coordinate axes.

Diagram 3 represents an accurate drawing, on graph paper, of ONE of the symmetrical halves of the front plate.

Using 5 strips of equal width, calculate an estimate of the area of metal shown in the graph.

Hence calculate the total area of metal in the COMPLETE front plate.

Ans: ____ [5 marks]

(b) Ask for the model for Question 13 (b). The model is NOT made to scale.
 The model represents the inner part of a pizza oven.
 Pizzas are cooked in the inner part of the pizza oven.
 The inner part is in the shape of a half-cylinder.

A hole is needed in the top of the oven to let hot air out.

Look at the diagram for Question 13 (b) in the separate Diagram Booklet.
 The diagrams are NOT drawn to scale.

Diagram 1 shows a side view of the oven. The diagram shows the relative positions of points A, B and C on the model.

Diagram 2 shows a front view of the oven. The diagram shows the relative positions of points B and C at the front of the oven.

The straight-line distance from the centre of this hole to either of the front bottom corners of the oven should be less than 50 cm.

The line, AB, represents one of these straight-line distances.
 Show that the distance from A to B is less than 50 cm.

Ans: ____ [4 marks]

(c) Pizza-Rea supplies spiked legs for the pizza oven.

Ask for the model for Question 13 (c). The model is NOT made to scale.
 The model represents a spiked leg for the pizza oven.

Each leg is made by connecting a cuboid to a pyramid.
 The perpendicular height of the pyramid is 42 cm.

Look at the diagram for Question 13 (c) in the separate Diagram Booklet.
 The diagram is NOT drawn to scale.
 The diagram shows the side view of the spiked leg.

In the diagram:

$$AB = \frac{x}{2}$$

$$AD = 16 \text{ cm}$$

The perpendicular height of the pyramid = 42 cm.

The volume of each leg is 750 cm^3

Calculate the length x.

Give your answer in the form $a\sqrt{b}$, where a and b are integers and b is as small as possible.

Ans: ____ [6 marks]

TOTAL 80 MARKS
END OF PAPER
