

Print copy of Braille text (UEB)

WJEC GCSE EDUQAS

C300UA0-1

Mathematics – Component 1

Non-Calculator Mathematics

Foundation Tier

Thursday 15 May 2025 – Morning

2 hours 15 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.**
- **Model for Question 4**
- **Wikki Stix for Question 12**

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.

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.

You are reminded of the need for good English and orderly, clear presentation in your answers.

Answer ALL questions.

1. Look at the diagram for Question 1 in the separate Diagram Booklet.
The diagram is NOT drawn to scale.

A quarter of a circle has been cut from a rectangular card.

In the diagram:

PRST is a rectangle

PQT is a quarter of a circle

QR = 5 cm

TS = 15 cm.

Calculate the perimeter of the remaining piece of card.

Give your answer in the form $a\pi + b$.

Ans: Perimeter of the remaining piece of card is ____ cm [4 marks]

2. Jamie wants to buy a pair of trainers online.

The online company has a sale reducing all prices by 25%

Jamie also has a discount code that will give him a further 10% off all SALE PRICES.

Jamie says,

“The trainers have been reduced in price by a total of 35%”

Explain why Jamie is incorrect.

Ans.: ____ [1 mark]

3. (a) Given that $3^{m+4} = 1$, find the value of m .

Ans: ____ [1 mark]

(b) Betty bought c cakes costing £2 each and d doughnuts costing £1.50 each.

She paid with a twenty pound note and was given some change.

Write an inequality to show this information.

Ans: ____ [2 marks]

(c) Given that:

- distance x = 15 miles
- distance y = 36 kilometres
- 5 miles is approximately equal to 8 kilometres.

Choose the ratio that best represents

distance x : distance y

from the following list.

3:5 5:12 3:4 2:3 2:5

Ans: ____ [1 mark]

4. Ask for the model for Question 4

The model is NOT made to scale.

The model is a triangular prism labelled ABCDEF.

On the model:

AB = 6 cm

AC = 10 cm

CD = 7 cm

Angle ABC is a right angle.

Look at the diagram for Question 4 in the separate Diagram Booklet.

The diagram is NOT drawn to scale.

The diagram shows the cross-section of the prism.

In the diagram:

AB = 6 cm

AC = 10 cm

Angle ABC is a right angle.

Calculate the total surface area of the triangular prism.

Ans: The total surface area of the triangular prism is ____ cm² **[6 marks]**

5. Look at the diagram for Question 5 in the separate Diagram Booklet. The diagram is a Venn diagram.

Last week, 142 pupils in Year 7 were given English homework and French homework.

10 pupils did not complete either homework.

Each expression in the Venn diagram represents the number of pupils that completed at least one homework.

(a) Calculate the value of x .

Ans: $x = \underline{\hspace{2cm}}$ [3 marks]

(b) One pupil is chosen at random from the group.

What is the probability that this pupil completed ONLY the French homework?

Ans: The probability that a pupil completed ONLY the French homework is $\underline{\hspace{2cm}}$ [2 marks]

6. (a) Work out $2\frac{1}{5} - 1\frac{2}{3}$

Give your answer in its simplest form.

Ans: $\underline{\hspace{2cm}}$ [3 marks]

(b) Calculate the value of the reciprocal of 0.4

Give your answer as a decimal.

Ans: $\underline{\hspace{2cm}}$ [2 marks]

(c) ESTIMATE the value of $\frac{3.02^3 + \sqrt{4.17 \times 8.9}}{0.289}$

Ans: $\underline{\hspace{2cm}}$ [3 marks]

7. Use: $\text{Pressure} = \frac{\text{Force (N)}}{\text{Area (cm}^2\text{)}}$

A cuboid rests on a horizontal floor.

The cuboid exerts a force of 6.2 newtons on the floor.
The pressure of this cuboid on the floor is 0.05 N/cm^2

The base of the cuboid in contact with the floor has a WIDTH of 8 cm.

Calculate the LENGTH of the base of the cuboid.

Ans: Length of the base of the cuboid = ____ cm [5 marks]

8. (a) Work out the value of $5^{-32} \div 5^{-35}$

Ans: ____ [2 marks]

(b) In a vacuum, a particle of light travels at approximately 3×10^8 metres per second.

What is this speed in kilometres per minute?
Give your answer in standard form.

Ans: ____ [3 marks]

9. Look at the diagram for Question 9 in the separate Diagram Booklet.
The diagram is NOT drawn to scale.
The diagram shows a square labelled KLMN and a rectangle labelled PQRS.

In the square KLMN:

$$KL = 12.5 \text{ cm}$$

$$KN = (5x - 3y)$$

In the rectangle PQRS:

$$PQ = (3x + 2y)$$

$$PS = (7x - 6y)$$

$$SR = 17 \text{ cm}$$

Use an algebraic method (not trial and improvement) to find the value of x and the value of y.

Hence, calculate the perimeter of PQRS.

You must show all your working.

Ans: The perimeter of PQRS is ____ cm [7 marks]

10. It takes 5 workers a total of 24 hours to build a wall 180 m long.

(a) The workers have enough materials left over to build a further 300 m of the same wall.

How long will it take 8 WORKERS to build this 300 m of wall?

Ans: It will take 8 workers ____ hours to build 300 m of wall. [3 marks]

(b) (i) What assumption have you made in answering part (a)?

Ans: ____ [1 mark]

(ii) If your assumption is not correct, what effect would this have on your answer to part (a)?

Ans: ____ [1 mark]

11. (a) The n th term of a sequence is given by $2n^2 + 9$

Show that 90 is NOT a term in the sequence.

Ans: ____ [2 marks]

(b) The first four terms of a sequence are:

$$\begin{aligned} &2a^{17}b^3, \\ &4a^{15}b^6, \\ &8a^{13}b^{12}, \\ &16a^{11}b^{24}, \dots \end{aligned}$$

Write down the SIXTH term of this sequence.

Ans: ____ [2 marks]

(c) Look at the diagram for Question 11 (c) in the separate Diagram Booklet. The diagram shows shaded and white tiles used to make four patterns labelled Pattern 1, Pattern 2, Pattern 3 and Pattern 4

Write an expression for the TOTAL number of tiles needed to make Pattern n .

Ans: ____ [2 marks]

12. On the graph paper provided for Question 12 in the separate Diagram Booklet, draw the region that satisfies the following inequalities. Indicate clearly the region that is your answer.
A spare tactile diagram and Wikki Stix are provided for this question.

$$\begin{aligned}x &\leq 3 \\y &\geq 2 \\y &\leq x + 1 \\y &\geq 5 - 2x\end{aligned}$$

Ans: ____ [4 marks]

13. Rearrange the following formula to make u the subject.

$$\frac{t^2 + 4u}{u + 5} = w$$

Ans: ____ [4 marks]

14. Cally, Deena and Juan are working on a GCSE project. They are each in a different class. Cally, Deena and Juan each record the journey times to school of pupils in their own class.

(a) The times for pupils in Cally's class are shown in the table below.

Journey time, t (minutes)	Number of pupils
$0 < t \leq 5$	5
$5 < t \leq 15$	5
$15 < t \leq 30$	6
$30 < t \leq 50$	5
$50 < t \leq 60$	4

Look at the diagram for Question 14 (a) in the separate Diagram Booklet. The diagram is a histogram.

Cally decides to draw a histogram of her results.

Most of the frequency densities used in the histogram are incorrect.

What error did Cally make when she calculated the frequency densities?

Ans: ____ [1 mark]

(b) Look at the diagram for Question 14 (b) in the separate Diagram Booklet. The diagram shows an incomplete histogram.

Deena has correctly drawn the histogram for her results.

4 pupils take between 0 and 5 minutes to travel to school.

(i) Complete the scale on the frequency density axis.

Ans: (i) ____ (ii) ____ (iii) ____ (iv) ____ (v) ____ (vi) ____ [2 marks]

(ii) Calculate an estimate of the median journey time for the pupils in Deena's class.

You must show all your working.

Ans: ____ [3 marks]

(c) Juan decides to display the journey times of the 24 pupils for his class on a cumulative frequency diagram.

Look at the diagram for Question 14 (c) in the separate Diagram Booklet. The diagram shows Juan's cumulative frequency diagram.

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

(i) Calculate the percentage of pupils in Juan's class that take 45 minutes or longer to travel to school.

Ans: ____ [3 marks]

(ii) Complete the table **below** for the journey time to school of the pupils in Juan's class.

Median	(i)
Lower quartile	(ii)
Upper quartile	(iii)
Inter-quartile range	(iv)

Ans: (i) ____ (ii) ____ (iii) ____ (iv) ____ [3 marks]

(iii) Two pupils were absent when Juan collected his data.

The journey times of these two pupils are 6 minutes and 40 minutes.

What effect would including these two results have on the median journey time for the class?

Ans: ____ [1 mark]

15. Factorise and hence solve $3x^2 - 13x - 10 = 0$

Ans: ____ [3 marks]

16. (a) Use the iterative formula $x_{n+1} = 2x_n - 5$

Calculate the value of x_4 when $x_1 = 6$

Ans: $x_4 =$ ____ [2 marks]

(b) Use the iterative formula $x_{n+1} = \frac{2}{3}x_n$

Calculate the value of x_3 when $x_5 = 8$

Ans: $x_3 =$ ____ [2 marks]

17. (a) Calculate the value of $144^{0.5} \times 6^{-2}$

Give your answer as a fraction in its simplest form.

Ans: ____ [3 marks]

(b) Write $\frac{430}{33}$ as a recurring decimal.

Ans: ____ [1 mark]

(c) Expand and simplify $(9 + 2\sqrt{5})(4 - 3\sqrt{5})$

Ans: ____ [2 marks]

(d) Find the mean of $4\sqrt{75}$ and $3\sqrt{48}$

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

Ans: ____ [3 marks]

18. (a) Look at the diagram for Question 18 (a) in the separate Diagram Booklet.

The diagram is NOT drawn to scale.

The diagram shows triangle FGH.

X is a point on FH where $FX:XH = 3:2$

Y is the midpoint of FG.

$\mathbf{FX} = 9\mathbf{j}$ and $\mathbf{GH} = 8\mathbf{k}$.

Write the vector $\mathbf{FY}$ in the form $a\mathbf{j} + b\mathbf{k}$.

Ans: $\mathbf{FY} = \underline{\hspace{2cm}}$ [3 marks]

(b) Look at the diagram for Question 18 (b) in the separate Diagram Booklet.

The diagram is NOT drawn to scale.

The vectors $\mathbf{OA}$, $\mathbf{OB}$ and $\mathbf{OC}$ are shown in the diagram.

$$\mathbf{OA} = 2\mathbf{p} - 5\mathbf{q}$$

$$\mathbf{OB} = 5\mathbf{p} + \mathbf{q}$$

$$\mathbf{OC} = 6.5\mathbf{p} + 4\mathbf{q}$$

Show that the points A, B and C lie on a straight line.

Ans: $\underline{\hspace{2cm}}$ [4 marks]

19. A bag contains 3 pink cubes and 5 green cubes.

The following steps are taken.

- Step 1: A cube is chosen at random from the bag and replaced by 2 more cubes of the OTHER colour.
- Step 2: Repeat step 1
- Step 3: A third cube is chosen at random.

(a) Show that the probability that all three cubes are pink is $\frac{1}{120}$

Ans: $\underline{\hspace{2cm}}$ [3 marks]

(b) Calculate the probability that the first two cubes are the same colour and the third cube is a different colour

Ans: $\underline{\hspace{2cm}}$ [4 marks]

20. Look at the diagram for Question 20 in the separate Diagram Booklet. The diagram is NOT drawn to scale. The diagram is a sketch.

The sketch shows a circle with diameter PQ.

The line $y - 2x + 5 = 0$ is a tangent to the circle at the point Q.

Find the equation of the line PQ.

Write your answer in the form $ax + by + c = 0$

Ans: ____ [5 marks]

21. The function $f(x)$ is defined by $f(x) = 5x - 2$

(a) (i) Find $f^{-1}(x)$.

Ans: ____ [2 marks]

(ii) Find and simplify an expression for $ff(x)$.

Ans: ____ [2 marks]

(b) The function $g(x)$ is defined by $g(x) = kx^2 + 3$

Given that $fg(-2) = 73$, calculate the value of k .

Ans: ____ [4 marks]

TOTAL 120 MARKS

END OF PAPER
