

Paper Reference 1MA1/3F
Pearson Edexcel
Level 1/Level 2 GCSE (9–1)

Total Marks

Mathematics
PAPER 3 (Calculator)
Foundation Tier

Wednesday 14 June 2023 – Morning

Time: 1 hour 30 minutes

In the boxes below, write your name,
centre number and candidate number.

Surname					
Other names					
Centre Number					
Candidate Number					

YOU MUST HAVE

Ruler, protractor, compasses, writing and drawing equipment, calculator, Formulae Sheet (enclosed). Tracing paper may be used.

YOU WILL BE GIVEN

Diagram Booklet

INSTRUCTIONS

Answer ALL questions.

Answer the questions in the spaces provided in this Question Paper or on the separate diagrams – there may be more space than you need.

You must SHOW ALL YOUR WORKING.

(continued on the next page)

Turn over

Instructions continued.

**Diagrams are NOT accurately drawn,
unless otherwise indicated.**

CALCULATORS MAY BE USED.

**If your calculator does not have a π
button, take the value of π to be 3.142
unless the question instructs otherwise.**

INFORMATION

The total mark for this paper is 80

**The marks for EACH question are shown
in brackets – use this as a guide as
to how much time to spend on each
question.**

**There may be spare copies of some
diagrams in case you need them.**

(continued on the next page)

Turn over

Information continued.

**You may be provided with a model for
Question 8(b)
It is NOT accurate.**

**You may be provided with a shape for
Question 16
It is accurate.**

ADVICE

**Read each question carefully before you
start to answer it.**

Try to answer every question.

**Check your answers if you have time at
the end.**

5

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

Turn over

- 1. Write the number
three thousand one hundred and
seven in figures.**

(Total for Question 1 is 1 mark)

2. Write

$\frac{3}{10}$ as a percentage.

_____ %

(Total for Question 2 is 1 mark)

Turn over

3. Simplify

$$m + m + m + m$$

(Total for Question 3 is 1 mark)

4. Change

4000 grams into kilograms.

_____ kilograms

(Total for Question 4 is 1 mark)

Turn over

5. 7 -5 3 9 -2

Write these numbers in order of size.

Start with the smallest number.

(Total for Question 5 is 1 mark)

Turn over

6. Look at the diagram for Question 6 in the Diagram Booklet.

It shows a shape on a square grid.

Each square on the grid represents a 1 cm square.

(a) Find the area of the shape.

(1 mark)

_____ cm²

(continued on the next page)

Turn over

6. continued.

(b) Find the perimeter of the shape.

(1 mark)

_____ **cm**

(Total for Question 6 is 2 marks)

Turn over

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

It shows a 4-sided spinner.

Samina spins the spinner once.

(continued on the next page)

7. continued.

(a) Choose the word from the list below that best describes the probability that the spinner lands on 2

impossible unlikely evens
likely certain

(1 mark)

(continued on the next page)

Turn over

7. continued.

(b) Choose the word from the list below that best describes the probability that the spinner lands on a number less than 4

impossible unlikely evens
likely certain

(1 mark)

(continued on the next page)

Turn over

7. continued.

Ralph rolls a biased dice once.

The probability that he gets the number 5 is 0.4

**(c) Work out the probability that
Ralph does NOT get the number 5
(1 mark)**

**Answer space continues on the
next page.**

7. (c) continued.

(Total for Question 7 is 3 marks)

Turn over

8. A quadrilateral has 4 right angles and 4 sides of equal length.

(a) Write down the mathematical name of this quadrilateral.

(1 mark)

(continued on the next page)

8. continued.

**Look at the diagram for Question 8(b)
in the Diagram Booklet.**

You may be provided with a model.

They show a solid shape.

(continued on the next page)

8. continued.

**(b) Write down the mathematical
name of the shape.**

(1 mark)

(Total for Question 8 is 2 marks)

Turn over

9. The table below shows the number of books read by four people in one month.

Person	Number of books
Ximena (X)	7
Martha (M)	9
Kezia (K)	1
Tabby (T)	5

(continued on the next page)

9. continued.

(a) Work out the median number of books.

(2 marks)

(continued on the next page)

Turn over

9. continued.

(b) Find the range.

(1 mark)

(continued on the next page)

9. continued.

**(c) Look at the diagram for
Question 9(c) in the
Diagram Booklet.**

It shows a blank grid.

**On the grid, draw a bar chart to
show the information in the table
on page 21.**

(3 marks)

(Total for Question 9 is 6 marks)

- 10. Wayne begins walking at 8 30 am
He walks for 1 hour and 45 minutes.**

**Wayne then rests for 15 minutes.
He then walks for 85 minutes to a
cafe.**

**Does Wayne get to the cafe before
12 noon?**

**You must show how you get your
answer.**

(4 marks)

**Answer space continues on the next
two pages.**

10. continued.

Turn over

10. continued.

(Total for Question 10 is 4 marks)

Turn over

11. Gabriel thinks of a number.

**He multiplies his number by 5 and
then adds 7**

His answer is 72

What number did Gabriel think of?

(3 marks)

**Answer space continues on the next
page.**

11. continued.

(Total for Question 11 is 3 marks)

Turn over

**12. Look at the diagram for Question 12
in the Diagram Booklet.**

It shows a pie chart.

Some students took a guitar exam.

**The pie chart shows information
about the grades the students got.**

(continued on the next page)

12. continued.

(a) Write down the modal grade.

(1 mark)

(continued on the next page)

Turn over

12. continued.

7 students got distinction.

(b) Work out the total number of students who took the guitar exam.

(3 marks)

Answer space continues on the next page.

12. (b) continued.

(Total for Question 12 is 4 marks)

**13. Look at the diagram for Question 13
in the Diagram Booklet.**

It shows a graph.

**Rowena drove from her home to a
beach.**

**A travel graph for her journey is
shown in the Diagram Booklet.**

(continued on the next page)

13. continued.

Rowena stopped at a cafe on her way to the beach.

(a) (i) How many minutes did Rowena take to drive to the cafe?

(1 mark)

_____ minutes

(continued on the next page)

Turn over

13. (a) continued.

**(ii) Write down the distance from
Rowena's home to the cafe.**

(1 mark)

_____ miles

(continued on the next page)

Turn over

13. continued.

Rowena stayed at the beach for

$1\frac{1}{2}$ hours.

**She then drove home without
stopping.**

Rowena arrived home at 16 00

**(b) On the grid in the
Diagram Booklet, complete the
travel graph.**

(2 marks)

(continued on the next page)

13. continued.

**(c) Work out the average speed for
the journey from the beach to
Rowena's home.**

(1 mark)

_____ miles per hour

(Total for Question 13 is 5 marks)

Turn over

- 14. 120 boxes cost £6**
270 bags cost £10

A bag is cheaper than a box.

How much cheaper?

**Give your answer in pence correct to
1 decimal place.**

(4 marks)

**Answer space continues on the next
two pages.**

14. continued.

Turn over

14. continued.

_____ pence

(Total for Question 14 is 4 marks)

Turn over

- 15. There are only red beads and green beads in a bag.**

number of red beads : number of green beads = 1 : 4

There are 35 red beads in the bag.

Work out the total number of beads in the bag.

(2 marks)

Answer space continues on the next page.

15. continued.

(Total for Question 15 is 2 marks)

Turn over

16. Look at the diagram for Question 16 in the Diagram Booklet.

It shows shape **A and shape **B** on a grid.**

A cut out shape may be available if you wish to use it.

Describe fully the single transformation that maps shape **A onto shape **B****

(2 marks)

Answer lines continue on the next page.

16. continued.

(Total for Question 16 is 2 marks)

17. Look at the diagram for Question 17 in the Diagram Booklet.

It shows the position of town T

Town R is 75 km from town T on a bearing of 065°

Mark the position of town R on the diagram.

Use a scale of 1 cm to 10 km

(Total for Question 17 is 2 marks)

18. Solve

$$4(2x - 3) = 20$$

x = _____

(Total for Question 18 is 3 marks)

Turn over

- 19. Jenny invests £3000 for 6 years at $y\%$ simple interest per year.**

At the end of the 6 years, Jenny has received a total of £450 in interest.

**Work out the value of y
(3 marks)**

Answer space continues on the next two pages.

19. continued.

Turn over

19. continued.

$y =$ _____

(Total for Question 19 is 3 marks)

Turn over

- 20. (a) Simplify**
 $(m^2)^3$
(1 mark)
-

(continued on the next page)

Turn over

20. continued.

(b) Simplify

$$y^5 \times y^8$$

(1 mark)

(continued on the next page)

Turn over

20. continued.

(c) Expand

$$4p(p^2 + 3p)$$

(2 marks)

(Total for Question 20 is 4 marks)

Turn over

21. Jonny wants to know how much coffee he will need for 800 people at a meeting.

Each person who drinks coffee will drink 2 cups of coffee.

10·6 grams of coffee is needed for each cup of coffee.

(continued on the next page)

21. continued.

Jonny assumes 68% of the people will drink coffee.

(a) Using this assumption, work out the amount of coffee Jonny needs.

Give your answer correct to the nearest gram.

(4 marks)

Answer space continues on the next two pages.

Turn over

21. (a) continued.

Turn over

21. (a) continued.

_____ grams

(continued on the next page)

Turn over

21. continued.

Jonny's assumption is wrong.

72% of the people will drink coffee.

**(b) How does this affect your answer
to part (a)?**

(1 mark)

(Total for Question 21 is 5 marks)

Turn over

22. Look at the diagram for Question 22 in the Diagram Booklet.

It shows triangle AGF and two straight lines ACF and ADG. BCD and EFG are parallel lines.

Angle CDG = 110°

Angle EFC = 125°

Show that triangle ACD is isosceles.

Give a reason for each stage of your working.

(5 marks)

Answer space continues on the next two pages.

22. continued.

Turn over

22. continued.

(Total for Question 22 is 5 marks)

Turn over

23. It takes 14 hours for 5 identical pumps to fill a water tank.

How many hours would it take 4 of these pumps to fill another water tank of the same size?

(2 marks)

Answer space continues on the next page.

23. continued.

_____ hours

(Total for Question 23 is 2 marks)

Turn over

24. A and B are numbers such that

$$A = 2^2 \times 3^4 \times 7$$

$$B = 3^2 \times 7^2$$

- (a) Find the highest common factor (HCF) of A and B**
(1 mark)

Answer space continues on the next page.

24. (a) continued.

(continued on the next page)

Turn over

24. continued.

Remember:

$$\mathbf{A = 2^2 \times 3^4 \times 7}$$

$$\mathbf{B = 3^2 \times 7^2}$$

**(b) Find the lowest common multiple
(LCM) of *A* and *B***

(2 marks)

**Answer space continues on the
next page.**

Turn over

24. (b) continued.

(Total for Question 24 is 3 marks)

Turn over

- 25. Lava flows from a volcano at a constant rate of $11.9 \text{ m}^3/\text{s}$**

How many days does it take for $67\,205\,600 \text{ m}^3$ of lava to flow from the volcano?

Give your answer correct to the nearest day.

(3 marks)

Answer space continues on the next page.

25. continued.

_____ days

(Total for Question 25 is 3 marks)

Turn over

26. Look at the diagram for Question 26 in the Diagram Booklet.

It shows the graph of

$$y = x^2 - 2x - 2$$

- (a) Write down the coordinates of the turning point on the graph of**
- $$y = x^2 - 2x - 2$$

(1 mark)

(_____ , _____)

(continued on the next page)

Turn over

26. continued.

- (b) Write down an estimate for one of the roots of $x^2 - 2x - 2 = 0$**
(1 mark)
- _____

(Total for Question 26 is 2 marks)

27. A solid cuboid is made of metal.

The metal has a density of 9 g/cm^3

The volume of the cuboid is 72 cm^3

Work out the mass of the cuboid.

(2 marks)

Answer space continues on the next page.

27. continued.

_____ grams

(Total for Question 27 is 2 marks)

Turn over

28. (a) Write

**$(9 \times 10^4) : (4.5 \times 10^6)$ in the
form $1 : n$ where n is an integer.
(2 marks)**

(continued on the next page)

Turn over

28. continued.

(b) Write the following numbers in order of size.

Start with the smallest number.

(2 marks)

$$5.625 \times 10^4$$

$$5625$$

$$56250 \times 10^{-3}$$

$$0.005625 \times 10^5$$

Answer space is on the next page.

28. (b) continued.

(Total for Question 28 is 4 marks)

TOTAL FOR PAPER IS 80 MARKS

END OF PAPER
