

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

Total Marks

Mathematics
PAPER 1
(Non-Calculator)
Higher Tier

Time: 1 hour 30 minutes plus your additional time allowance

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. 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.

Diagrams are NOT accurately drawn, unless otherwise indicated.

CALCULATORS MAY NOT BE USED.

Turn over

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.**

**You may be provided with models for Question 6 and
Question 7**

They are NOT accurate.

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

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.

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1. (a) Work out

$$3.67 \times 4.2$$

(3 marks)

(continued on the next page)

Turn over

1. continued.

(b) Work out

$$59.84 \div 1.6$$

(3 marks)

(Total for Question 1 is 6 marks)

Turn over

2. Look at the diagram for Question 2 in the Diagram Booklet.

It shows an incomplete Venn diagram.

$$\mathcal{E} = \{\text{even numbers less than } 19\}$$

$$A = \{6, 12, 18\}$$

$$B = \{2, 6, 14, 18\}$$

Complete the Venn diagram in the Diagram Booklet for this information.

(Total for Question 2 is 3 marks)

3. Work out

$$4\frac{1}{5} - 2\frac{2}{3}$$

Give your answer as a mixed number.

(Total for Question 3 is 3 marks)

Turn over

4. At the end of 2017

the value of Tamara's house was £220 000

the value of Rahim's house was £160 000

At the end of 2019

the value of Tamara's house had decreased by 20%

the value of Rahim's house had increased by 30%

At the end of 2019, whose house had the greater value?

You must show how you get your answer.

(4 marks)

Answer space continues on the next page.

4. continued.

(Total for Question 4 is 4 marks)

Turn over

5. Look at the information for Question 5 in the Diagram Booklet.

Rosie, Matilda and Ibrahim collect stickers.

Ibrahim has **24** more stickers than Matilda.

Ibrahim has more stickers than Rosie.

How many more?

(3 marks)

Answer space continues on the next page.

5. continued.

(Total for Question 5 is 3 marks)

6. Look at Diagram 1 and Diagram 2 for Question 6 in the Diagram Booklet.

You may be provided with a model.

Diagram 1 and the model show a prism.

The cross section of the prism shown in Diagram 2 is a right-angled triangle labelled **ABC**

Angle **ABC** is a right angle.

The base of the triangle, **BC = 5 cm**

The prism has length **25 cm**

The prism has volume **750 cm^3**

Work out the height of the prism.

(3 marks)

Answer space continues on the next page.

6. continued.

_____ cm

(Total for Question 6 is 3 marks)

Turn over

7. Look at Diagram 1, Diagram 2 and the formula for Question 7 in the Diagram Booklet.

You may be provided with two models.

Diagram 1 and Model A show a cube with edges of length x cm

Diagram 2 and Model B show a sphere of radius 3 cm

The surface area of the cube is equal to the surface area of the sphere.

Show that $x = \sqrt{k\pi}$ where k is an integer.
(4 marks)

Answer space continues on the next page.

7. continued.

(Total for Question 7 is 4 marks)

Turn over

8. Solve

$$y^2 = 5y + 24$$

(Total for Question 8 is 3 marks)

9. (a) Write down the value of 7^0

(1 mark)

- (b) Find the value of $3 \times 3^6 \times 3^{-6}$

(1 mark)

(continued on the next page)

9. continued.

(c) Find the value of

$$2^{-4}$$

(1 mark)

(d) Find the value of

$$27^{\frac{1}{3}}$$

(1 mark)

(Total for Question 9 is 4 marks)

Turn over

10. Look at the diagram for Question 10 in the Diagram Booklet.

It shows a shape made from 6 identical squares.

The total area of the shape is 5406 cm^2

(a) Find an estimate for the length of one side of each square.

Give your answer correct to the nearest whole number.

(3 marks)

Answer space continues on the next page.

10. (a) continued.

_____ **cm**

(b) Is your answer to part (a) an underestimate or an overestimate?

You must give a reason for your answer.

(1 mark)

(Total for Question 10 is 4 marks)

Turn over

11. Look at the diagram for Question 11 in the Diagram Booklet.

It shows two rectangles, A and B

All measurements are in centimetres.

The area of rectangle A is equal to the area of rectangle B

Find an expression for y in terms of w

(4 marks)

Answer space continues on the next page.

11. continued.

(Total for Question 11 is 4 marks)

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

It shows a grid.

The cumulative frequency table below gives information about the heights, in cm, of 40 plants.

Height (h cm)	Cumulative Frequency
$0 < h \leq 5$	5
$0 < h \leq 10$	10
$0 < h \leq 15$	25
$0 < h \leq 20$	35
$0 < h \leq 25$	38
$0 < h \leq 30$	40

(a) On the grid in the Diagram Booklet, draw a cumulative frequency graph for this information.

(2 marks)

(continued on the next page)

12. continued.

(b) Use the graph in the Diagram Booklet to find an estimate for the median height of the plants.

(1 mark)

_____ cm

(Total for Question 12 is 3 marks)

13. Ted is trying to change $0.\dot{4}\dot{3}$ to a fraction.

Here is the start of his method.

$$x = 0.\dot{4}\dot{3}$$

$$10x = 4.\dot{3}\dot{4}$$

$$10x - x = 4.\dot{3}\dot{4} - 0.\dot{4}\dot{3}$$

Evaluate Ted's method so far.

(Total for Question 13 is 1 mark)

14. Look at the diagram for Question 14 in the Diagram Booklet.

It shows the shape **ABCDEF**

All the measurements are in centimetres.

$$AB = x + 1$$

$$BC = 4$$

$$EF = 2x + 6$$

$$AF = x + 11$$

All the marked angles are right angles.

The area of the shape is $A \text{ cm}^2$

Show that $A = 2x^2 + 24x + 46$

(3 marks)

Answer space continues on the next page.

14. continued.

(Total for Question 14 is 3 marks)

Turn over

15. Show that $\frac{4y + 3}{2y} + \frac{3}{5}$ can be written in the form $\frac{ay + b}{cy}$ where a , b and c are integers.

(3 marks)

Answer space continues on the next page.

15. continued.

(Total for Question 15 is 3 marks)

Turn over

16. There are only 3 red counters and 5 yellow counters in a bag.

Jude takes at random 3 counters from the bag.

Work out the probability that he takes exactly one red counter.

(4 marks)

Answer space continues on the next page.

16. continued.

(Total for Question 16 is 4 marks)

Turn over

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

It shows a grid.

On the grid show, by shading, the region that satisfies all of these inequalities.

$$2y + 4 < x$$

$$x < 3$$

$$y < 6 - 3x$$

Label the region **R**

(Total for Question 17 is 3 marks)

Turn over

18. Look at the diagram for Question 18 in the Diagram Booklet.

It shows trapezium **ABCD**

AB is parallel to **DC**

BC = 6 cm

Angle **BCD = 30°**

The area of the trapezium is **66 cm²**

the length of **AB**:the length of **CD = 2:3**

Find the length of **AB**

(5 marks)

Answer space continues on the next page.

18. continued.

_____ cm

(Total for Question 18 is 5 marks)

Turn over

19. Show that

$\frac{8 + \sqrt{12}}{5 + \sqrt{3}}$ can be written in the form $\frac{a + \sqrt{3}}{b}$,

where **a** and **b** are integers.

(Total for Question 19 is 4 marks)

Turn over

20. Look at the diagram for Question 20 in the Diagram Booklet.

It shows the graph of $x^2 + y^2 = 30 \cdot 25$

Use the graph to find estimates for the solutions of the simultaneous equations

$$x^2 + y^2 = 30 \cdot 25$$

$$y - 2x = 1$$

(Total for Question 20 is 3 marks)

21. The functions **f** and **g** are such that

$$f(x) = 3x^2 + 1 \text{ for } x > 0 \text{ and}$$

$$g(x) = \frac{4}{x^2} \text{ for } x > 0$$

(a) Work out **gf(1)**

(2 marks)

(continued on the next page)

21. continued.

The function h is such that $h = (fg)^{-1}$

(b) Find $h(x)$

(4 marks)

(Total for Question 21 is 6 marks)

Turn over

22. Find the coordinates of the turning point on the curve with equation

$$y = 9 + 18x - 3x^2$$

You must show all your working.

(_____ , _____)

(Total for Question 22 is 4 marks)

TOTAL FOR PAPER IS 80 MARKS

END OF PAPER
