Paper Reference 4MA1/2H
Pearson Edexcel
International GCSE

Total Marks

Mathematics A
PAPER: 2H
Higher Tier
(Calculator)

Time: 2 hours

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

Surname						
Other names						
Centre Number						
Candidate Number						

Q68798RA

Pearson

YOU MUST HAVE

Ruler, protractor, compasses, writing and drawing equipment, calculator. Tracing paper may be used.

YOU WILL BE GIVEN

Diagram Booklet
Formulae Pages

INSTRUCTIONS

Answer ALL questions.

Without sufficient working, correct answers may be awarded no marks.

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

CALCULATORS MAY BE USED.

You must NOT write anything on the Formulae Pages. Anything you write on the Formulae Pages will gain NO credit.

INFORMATION

The total mark for this paper is 100

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.

ADVICE

Read each question carefully before you start to answer it.

Check your answers if you have time at the end.

Answer ALL TWENTY FOUR questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1. Below are six integers where $w < x < y < z$

w x y z z z

The mode of the integers is 9

The median of the integers is 8

The range of the integers is 4

Work out the value of w, the value of x, the value of y and the value of z

(3 marks)

Answer space continues on the next page.

1. continued.

w = _____

x = _____

y = _____

z = _____

(Total for Question 1 is 3 marks)

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2. (a) Look at the diagram for Question 2 in the Diagram Booklet.

It shows a grid.

On the grid, draw and label with its equation the straight line with equation

(i) $y = 1$

(ii) $x = 2$

(iii) $x + y = 7$

(3 marks)

(b) Show, on the grid in the Diagram Booklet, the region that satisfies ALL THREE of the inequalities below

$y \geq 1$

$x \geq 2$

$x + y \leq 7$

Label the region **R**

(1 mark)

(Total for Question 2 is 4 marks)

3. An aeroplane travelled from New York City to Los Angeles.

The aeroplane travelled a distance of 3980 kilometres in 5 hours 24 minutes.

Work out the average speed of the aeroplane.

Give your answer in kilometres per hour correct to the nearest whole number.

(3 marks)

Answer space continues on the next page.

3. continued.

_____ kilometres per hour

(Total for Question 3 is 3 marks)

4. Show that

$$5\frac{1}{3} - 2\frac{6}{7} = 2\frac{10}{21}$$

(3 marks)

Answer space continues on the next page.

4. continued.

(Total for Question 4 is 3 marks)

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

It is NOT accurately drawn.

It shows an 8–sided shape **ABCDEFGH**

HG = 28 cm

AH = FG = 12 cm

AB = EF = 5 cm

The height of the shape is **20 cm**

CD is parallel to **HG**

AH is parallel to **FG**

All the marked angles are right angles.

The area of shape **ABCDEFGH** is **434 cm^2**

Find the length of **CD**

(4 marks)

Answer space continues on the next two pages.

5. continued.

5. continued.

_____ **cm**

(Total for Question 5 is 4 marks)

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

It is NOT accurately drawn.

It shows triangle PQR

PR = 9·5 cm

PQ = x cm

Angle QPR = 42°

Angle PQR is a right angle.

Work out the value of x

Give your answer correct to one decimal place.

(3 marks)

Answer space continues on the next page.

6. continued.

$x =$ _____

(Total for Question 6 is 3 marks)

7. Change a speed of 81 kilometres per hour to a speed in metres per second.

_____ **metres per second**

(Total for Question 7 is 3 marks)

8. Look at the information for Question 8 in the Diagram Booklet.

Work out what fraction of the 300 celebration cards have numbers on them.

Give your answer in its simplest form.

(5 marks)

Answer space continues on the next page.

8. continued.

(Total for Question 8 is 5 marks)

9. Pasha invests 50 000 dollars in a savings account for 4 years.
He gets 1·3% per year compound interest.

Work out how much money Pasha will have in his savings account at the end of 4 years.
Give your answer correct to the nearest dollar.

(3 marks)

Answer space continues on the next page.

9. continued.

_____ dollars

(Total for Question 9 is 3 marks)

10. Solve the simultaneous equations

$$7x + 3y = 3$$

$$3x - y = 7$$

Show clear algebraic working.

x = _____

y = _____

(Total for Question 10 is 3 marks)

11. (i) Factorise

$$x^2 + 5x - 24$$

(2 marks)

(ii) Hence, solve

$$x^2 + 5x - 24 = 0$$

(1 mark)

(Total for Question 11 is 3 marks)

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12. Larry is a delivery man.

He has 7 parcels to deliver.

The mean weight of the 7 parcels is 2·7 kg

Larry delivers 3 of the parcels.

Each of these 3 parcels has a weight of W kg

The mean weight of the other 4 parcels is 3·3 kg

Work out the value of W

(3 marks)

Answer space continues on the next page.

12. continued.

W = _____

(Total for Question 12 is 3 marks)

13. Look at the table for Question 13 in the Diagram Booklet.

It gives information about the ages, in years, of **80** people in a train carriage.

(a) Complete the cumulative frequency table below.

There are six spaces to fill.

(1 mark)

Age (a years)	Cumulative frequency
$0 < a \leq 20$	
$0 < a \leq 30$	
$0 < a \leq 40$	
$0 < a \leq 50$	
$0 < a \leq 60$	
$0 < a \leq 70$	

(continued on the next page)

13. continued.

Look at the diagram for Question 13(b) in the Diagram Booklet.

It shows a grid.

(b) On the grid, draw a cumulative frequency graph for your table.

(2 marks)

(c) Use your graph to find an estimate for the median age of the 80 people.

(1 mark)

_____ years

(continued on the next page)

13. continued.

Of the people in the train carriage, 60% of those who are aged between 25 and 60 are going to work. None of the other people in the train carriage are going to work.

(d) Use your graph to find an estimate for the number of people in the train carriage who are going to work.

(3 marks)

(Total for Question 13 is 7 marks)

14. (a) Expand and simplify

$$(5 - y)(2y + 3)(y + 4)$$

Show your working clearly.

(3 marks)

(continued on the next page)

14. continued.

(b) Make n the subject of

$$k = \frac{n + 3}{4 + n} - 7$$

(4 marks)

Answer space continues on the next page.

14. (b) continued.

(Total for Question 14 is 7 marks)

15. (a) Solve

$$\frac{4x+5}{3} - \frac{3-2x}{2} = 13$$

Show clear algebraic working.

(4 marks)

Answer space continues on the next page.

15. (a) continued.

x = _____

(continued on the next page)

15. continued.

(b) Solve the inequality

$$2y^2 - 7y - 30 \leq 0$$

Show your working clearly.

(3 marks)

Answer space continues on the next page.

15. (b) continued.

(Total for Question 15 is 7 marks)

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

It shows an incomplete Venn diagram.

100 farmers are asked if they have goats (G), sheep (S) or chickens (C) on their farms.

Of these farmers

31 have sheep

53 have chickens

6 have goats, sheep and chickens

11 have sheep and goats

17 have sheep and chickens

18 have goats and chickens

20 do not have any goats, sheep or chickens

(a) Using this information, complete the Venn diagram in the Diagram Booklet to show the number of farmers in each appropriate subset.

(3 marks)

(continued on the next page)

16. continued.

(b) Find

(i) $n(G)$

(1 mark)

(ii) $n([G \cup S]')$

(1 mark)

(iii) $n(G' \cap C)$

(1 mark)

(continued on the next page)

16. continued.

One of the farmers who has chickens is chosen at random.

(c) Find the probability that this farmer also has goats.

(2 marks)

(Total for Question 16 is 8 marks)

17. M varies directly as the cube of p

$M = 4$ when $p = 0 \cdot 5$

Find the value of p when $M = 500$

(Total for Question 17 is 4 marks)

18. Given that

$$X = \frac{2p - q}{t}$$

when

$p = 7 \cdot 5$ correct to 1 decimal place,

$q = 3 \cdot 42$ correct to 2 decimal places,

$t = 2$ correct to the nearest whole number,

work out the upper bound of the value of X

Show your working clearly.

(3 marks)

Answer space continues on the next page.

18. continued.

(Total for Question 18 is 3 marks)

19. Given that

$$n = \frac{14}{3x - 7}$$

$$x = \frac{7}{4y - 3}$$

express n in the form $\frac{py + q}{ry + s}$ where p, q, r and s are integers.

Give your answer in its simplest form.

(3 marks)

Answer space continues on the next page.

19. continued.

$n = \_\_\_\_\_$

(Total for Question 19 is 3 marks)

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

It is NOT accurately drawn.

The diagram shows four identical circles drawn inside a square.

Each circle touches two other circles and two sides of the square.

The region inside the square that is outside the circles, shown shaded in the diagram, has a total area of $40\ cm^2$

Work out the perimeter of the square.

Give your answer correct to 3 significant figures.

(4 marks)

Answer space continues on the next page.

20. continued.

_____ cm

(Total for Question 20 is 4 marks)

21. Look at the diagram for Question 21 in the Diagram Booklet.

It is NOT accurately drawn.

OAB is a triangle.

Q is the point on **AB** such that **OQP** is a straight line.

$\overrightarrow{OA} = 4\underline{a}$

$\overrightarrow{OB} = 6\underline{b}$

$\overrightarrow{AP} = 2\underline{a} + 8\underline{b}$

Using a vector method, find the ratio **AQ : QB**

(5 marks)

Answer space continues on the next two pages.

21. continued.

21. continued.

AQ : QB = _____

(Total for Question 21 is 5 marks)

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22. **ABCD is a kite, with diagonals AC and BD, drawn on a centimetre square grid, with a scale of 1 cm for 1 unit on each axis.**

A is the point with coordinates $(-3, 4)$

The diagonals of the kite intersect at the point M with coordinates $(0, 2)$

Given that $AB = AD = 6 \cdot 5$ cm and the x coordinate of B is positive,

find the coordinates of the points B and D

(7 marks)

Answer space continues on the next two pages.

22. continued.

22. continued.

(_____ , _____)

(_____ , _____)

(Total for Question 22 is 7 marks)

23. Look at the diagram for Question 23 in the Diagram Booklet.

It shows a sketch of the graph of

$$y = \cos\left(\frac{x}{2}\right)^\circ$$

(i) Find the coordinates of the point **A**

(1 mark)

(_____ , _____)

(ii) Find the coordinates of the point **B**

(1 mark)

(_____ , _____)

(Total for Question 23 is 2 marks)

24. Given that

$$\frac{18 \times \left(\sqrt{27}\right)^{4n+6}}{6 \times 9^{2n+8}} = 3^{x}$$

express x in terms of n

Show your working clearly and simplify your expression.

(3 marks)

Answer space continues on the next two pages.

24. continued.

24. continued.

x = _____

(Total for Question 24 is 3 marks)

TOTAL FOR PAPER IS 100 MARKS

END OF PAPER