

Paper Reference(s) 4MA1/1HR
Pearson Edexcel International GCSE

Mathematics A
PAPER 1HR
Higher Tier
(Calculator)

Total Marks

Thursday 16 May 2024 – Morning

Time: 2 hours

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

Surname					
Other names					
Centre Number					
Candidate Number					

YOU MUST HAVE

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

YOU WILL BE GIVEN

A separate Formulae Booklet

A separate Diagram Booklet

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 in the separate Diagram Booklet – there may be more space than you need.

Calculators may be used.

(continued on the next page)

Turn over

INSTRUCTIONS continued.

You must NOT write anything in the Formulae Booklet. 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.

You may be given models for Question 6 and Question 22. They are not accurate.

ADVICE

Read each question carefully before you start to answer it.

Check your answers if you have time at the end.

Answer ALL TWENTY THREE questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1. Six cards are shown below.

Five of the cards have a number written on them.

16	15	3	2	9	
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**Work out the number that should be written on the last card so that the mean of the six numbers will be 11
(3 marks)**

Answer space continues on the next page.

1. continued.

(Total for Question 1 is 3 marks)

Turn over

2. Look at the diagram for Question 2 in the separate Diagram Booklet. The diagram shows a biased spinner.

The table below gives information about the probability that, when the spinner is spun once, it will land on each number.

Number	1	2	3	4	5
Probability	$2x$	0.27	0.04	x	0.12

Alexis is going to spin the spinner 400 times.

Work out an estimate for the number of times the spinner will land on an odd number.
(4 marks)

Answer space continues on the next page.

2. continued.

(Total for Question 2 is 4 marks)

Turn over

3. Norberto sells white loaves of bread and brown loaves of bread.

He sells a total of 200 loaves such that the number of white loaves sold : the number of brown loaves sold = 3 : 2

Norberto sells the white loaves for £1.50 each.

He sells the brown loaves for £1.75 each.

40% of the price of a white loaf is profit.

60% of the price of a brown loaf is profit.

Work out Norberto's total profit when he sells all 200 loaves.

(5 marks)

Answer space continues on the next page.

3. continued.

£ _____

(Total for Question 3 is 5 marks)

Turn over

4. Show that $2\frac{1}{3} \div 5\frac{1}{4} = \frac{4}{9}$

(Total for Question 4 is 3 marks)

Turn over

- 5. Slavomir invests 5200 euros in a savings account for 4 years.**

He gets 2.5% per year compound interest.

Work out how much money Slavomir will have in the savings account at the end of 4 years.

Give your answer correct to the nearest euro.

(3 marks)

Answer space continues on the next page.

5. continued.

_____ euros

(Total for Question 5 is 3 marks)

Turn over

6. Look at the diagram for Question 6 in the separate Diagram Booklet. The diagram is NOT accurately drawn. The diagram shows a solid wooden cylinder.

You may also be given a model.

The cylinder has radius 8 cm and height h cm.

The volume of the cylinder is 1208 cm^3

(continued on the next page)

6. continued.

(a) Work out the value of h

Give your answer correct to the nearest whole number.

(2 marks)

$h =$ _____

(continued on the next page)

Turn over

6. continued.

**(b) The density of the wood is
 1.25 g/cm^3**

**Work out the mass of the cylinder.
Give your answer in kilograms.
(2 marks)**

_____ kilograms

(Total for Question 6 is 4 marks)

Turn over

7. (a) Simplify $g^9 \div g^2$
(1 mark)
-

- (b) Expand $5k^2(k^3 + 4)$
(2 marks)
-

(continued on the next page)

7. continued.

**(c) (i) Factorise $x^2 - 2x - 63$
(2 marks)**

(continued on the next page)

Turn over

7. (c) continued.

**(ii) Hence, solve $x^2 - 2x - 63 = 0$
(1 mark)**

(continued on the next page)

7. continued.

(d) Solve the inequality

$$7 - 2y < 3y - 12$$

(3 marks)

(Total for Question 7 is 9 marks)

Turn over

- 8. Look at the diagram for Question 8 in the separate Diagram Booklet.**
The diagram is NOT accurately drawn.
The diagram shows a trapezium, ABCD

In the diagram:

DAB and ADC are right angles.

AD = 15 cm

DC = 14 cm

The area of the trapezium is 360 cm^2

Work out the perimeter of the trapezium.
(6 marks)

Answer space continues on the next page.

8. continued.

_____ cm

(Total for Question 8 is 6 marks)

Turn over

9. Look at the diagram for Question 9 in the separate Diagram Booklet. The diagram shows a coordinate grid. Line L is drawn on the grid.

Find an equation for L

Give your answer in the form $y = mx + c$

(Total for Question 9 is 3 marks)

Turn over

10. Here are the numbers of goals scored by a hockey team in its 11 games this season.

0 1 2 2 3 4 4 6 7 9 11

Work out the interquartile range of the numbers of goals.

(Total for Question 10 is 2 marks)

11. (a) $A = 2^5 \times 5 \times 7^2$

$$B = 2^3 \times 5^3 \times 7^4$$

Write down the highest common factor (HCF) of $5A$ and $2B$

Give your answer as a product of prime factors.

(2 marks)

11. continued.

(b) $A = 2^5 \times 5 \times 7^2$

$$B = 2^3 \times 5^3 \times 7^4$$

Work out the value of $(AB)^2$

Give your answer as a product of prime factors.

(2 marks)

(Total for Question 11 is 4 marks)

Turn over

12. Solve the simultaneous equations

$$4x + 3y = 9 \cdot 6$$

$$6x + 5y = 16 \cdot 8$$

Show clear algebraic working.

(4 marks)

Answer space continues on the next page.

12. continued.

x = _____

y = _____

(Total for Question 12 is 4 marks)

13. Look at the diagram for Question 13 in the separate Diagram Booklet. The diagram is NOT accurately drawn.

The diagram shows points A, B, C and D on a circle, centre O

Angle BCD = 128°

Work out the size of angle OBD

Give a reason for each stage of your working.

(5 marks)

Answer space continues on the next page.

13. continued.

angle OBD = _____°

(Total for Question 13 is 5 marks)

Turn over

- 14. (a) Expand and simplify**
 $(3y + 1)(2 - y)(4 + y)$
(3 marks)

14. continued.

(b) Simplify fully $\left(\frac{a^3 c}{a^9 c^5} \right)^{-\frac{1}{2}}$
(3 marks)

Answer space continues on the next page.

14. (b) continued.

(Total for Question 14 is 6 marks)

15. Look at the diagram for Question 15 in the separate Diagram Booklet. The diagram is NOT accurately drawn. The diagram shows isosceles triangle EFG

In the diagram:

$EF = GF$

Angle EFG = 130°

The area of triangle EFG is 74 cm^2

Work out the length of EF

Give your answer correct to

3 significant figures.

(3 marks)

Answer space continues on the next page.

15. continued.

_____ cm

(Total for Question 15 is 3 marks)

16. The table below gives information about the heights, in metres, of the trees in a park.

Height (h metres)	Frequency
$0 < h \leq 5$	15
$5 < h \leq 10$	20
$10 < h \leq 20$	15
$20 < h \leq 30$	10

On the grid provided for Question 16 in the separate Diagram Booklet, draw a histogram for this information.

(Total for Question 16 is 3 marks)

17. (a) $\left(\sqrt[4]{k^{12}}\right)^5 = k^n$

Find the value of n
(1 mark)

n = _____

(continued on the next page)

17. continued.

(b) Express $\frac{7}{2 - \sqrt{3}}$ in the form $\sqrt{c} + d$

where c and d are integers.

**Show your working clearly.
(3 marks)**

Answer space continues on the next page.

17. (b) continued.

(Total for Question 17 is 4 marks)

18. Look at the diagram for Question 18 in the separate Diagram Booklet. The diagram is NOT accurately drawn. The diagram shows two similar vases, A and B

The height of vase A is 30 cm

The height of vase B is 12 cm

Given that

surface area of vase A – surface area of vase B = 178.5 cm^2

find the surface area of vase A

(4 marks)

Answer space continues on the next page.

18. continued.

_____ cm^2

(Total for Question 18 is 4 marks)

Turn over

19. A curve **C** has equation
$$y = x^3 - 8x^2 - 12x + 5$$

Curve **C** has exactly two stationary points, one at point **A** and one at point **B** such that

x coordinate of point **A** > **x** coordinate of point **B**

Find the coordinates of point **A**
Show clear algebraic working.
(5 marks)

Answer space continues on the next 2 pages.

19. continued.

19. continued.

(_____ , _____)

(Total for Question 19 is 5 marks)

Turn over

20. (a) Express $2x^2 - 11x + 9$ in the form $a(x - b)^2 - c$ where a , b and c are numbers to be found.
(3 marks)

20. continued.

(b) The curve C has equation
 $y = 2(x - 3)^2 - 11(x - 3) + 9$

**The point P is the minimum point
on C**

Find the coordinates of P
(2 marks)

Answer space continues on the next page.

20. (b) continued.

(_____ , _____)

(Total for Question 20 is 5 marks)

**21. There are 25 counters in a bag such that
6 counters are blue
 x counters are orange, where $x > 9$
the rest of the counters are pink**

**Maalam takes at random two of the
counters from the bag.**

**The probability that Maalam takes one
orange counter and one pink counter**

is $\frac{22}{75}$

**Calculate the probability that Maalam
takes 2 pink counters from the bag.**

Show clear algebraic working.

(5 marks)

Answer space continues on the next 2 pages.

Turn over

21. continued.

21. continued.

(Total for Question 21 is 5 marks)

Turn over

22. Look at the diagram for Question 22 in the separate Diagram Booklet. The diagram is NOT accurately drawn. The diagram shows a cuboid $ABCDEFGH$ with horizontal base $ADEH$. You may also be given a model.

In the diagram:

$$\mathbf{AB = 8\text{ cm}}$$

$$\mathbf{AD = 12\text{ cm}}$$

$$\mathbf{DE = 20\text{ cm}}$$

**M is the midpoint of the base $ADEH$ and
 P is the midpoint of the edge CF**

Work out the size of angle BMP

Give your answer correct to one decimal place.

(6 marks)

Answer space continues on the next 3 pages.

Turn over

22. continued.

22. continued.

22. continued.

o

(Total for Question 22 is 6 marks)

Turn over

23. Here are the first three terms of an arithmetic sequence.

$$(4y - 14) \quad , \quad (y + 2) \quad , \quad (7y - 9)$$

Find, as an integer, the sum of the first 40 terms of the sequence.

Show clear algebraic working.

(4 marks)

Answer space continues on the next 2 pages.

23. continued.

23. continued.

(Total for Question 23 is 4 marks)

TOTAL FOR PAPER IS 100 MARKS
END OF PAPER
