Paper Reference 4MA1/1H
Pearson Edexcel
International GCSE

Mathematics A
Paper 1H
(Calculator)
Higher Tier

Tuesday 19 May 2020 – Morning

Time: 2 hours plus your additional time allowance.

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

Surname	
Other names	
Centre Number	
Candidate Number	

V62652A

YOU MUST HAVE

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

YOU WILL BE GIVEN

Diagram Book
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.

ADVICE

Read each question carefully before you start to answer it.

Check your answers if you have time at the end.

Answer **ALL TWENTY FIVE** questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1. Look at the diagram for Question 1 in the Diagram Book.

   It shows a Venn diagram.

   The numbers from **1** to **14** are shown in the Venn diagram.

   (a) List the members of the set $A \cap B$

   (1 mark)

   _____

Turn over

1. continued.

   (b) List the members of the set B'

   (1 mark)

_____

(continued on the next page)

1. continued.

A number is picked at random from the numbers in the Venn diagram.

(c) Find the probability that this number is in set A but is NOT in set B

(2 marks)

_____

(Total for Question 1 is 4 marks)

2. Toy cars are made in a factory.

The toy cars are made for **15** hours each day.

5 toy cars are made every **12** seconds.

For the toy cars made each day, the probability of a toy car being faulty is **0·002**

Work out an estimate of the number of faulty toy cars that are made each day.

(4 marks)

Answer space is on the next two pages.

2. **continued.**

2. **continued.**

(Total for Question 2 is 4 marks)

Turn over

3.   Look at the diagram for Question 3 in the Diagram Book.

It shows a grid.

Draw the graph of

$y = 7 - 4x$ for values of x from -2 to 3

(3 marks)

Space for working continues on the next page.

3.   continued.

(Total for Question 3 is 3 marks)

4.   Here is a list of six numbers written in order of size.

4   7   x   10   y   y

The numbers have

a median of 9

a mean of 11

Find the value of **x** and the value of **y**

(4 marks)

Answer space is on the next three pages.

Turn over

4. **continued.**

4.   **continued.**

4.   **continued.**

x = _____

y = _____

(Total for Question 4 is 4 marks)

5.   (a)   Write

$5{\cdot}7 \times 10^{-3}$ as an ordinary

number.

(1 mark)

_____

(continued on the next page)

5. continued.

(b) Write

800 000 in standard form.

(1 mark)

_____

(continued on the next page)

5. continued.

(c) Work out

$$\frac{3 \times 10^5 - 2 \cdot 7 \times 10^4}{6 \times 10^{-2}}$$

(2 marks)

_____

(Total for Question 5 is 4 marks)

Turn over

6. A rocket travelled **100 km** at an average speed of **28 440 km/h**

Work out how long it took the rocket to travel the **100 km**

Give your answer in seconds, correct to the nearest second.

(3 marks)

Answer space continues on the next page.

6. **continued.**

_____ **seconds**

(Total for Question 6 is 3 marks)

Turn over

7. (a) Solve

$$5(4 - x) = 7 - 3x$$

Show clear algebraic working.

(3 marks)

Answer space continues on the next page.

7. (a) continued.

X = _____

(continued on the next page)

7.   continued.

(b) Factorise fully

$$16m^3n^3 + 24m^2n^5$$

(2 marks)

_____

(continued on the next page)

7. **continued.**

(c) (i) Factorise

$$y^2 - 2y - 48$$

(2 marks)

_____

(continued on the next page)

7. (c) continued.

(ii) Hence, solve

$$y^2 - 2y - 48 = 0$$

(1 mark)

_____

(Total for Question 7 is 8 marks)

Turn over

8. Look at the diagram for Question 8 in the Diagram Book.

   It is NOT accurately drawn.

   It shows a **10**–sided polygon.

   Nine interior angles are labelled

   148°, 150°, 168°, 134°, 125°,

   125°, 134°, 168°, 150°

   One exterior angle is marked $x°$

   Work out the value of x

   (4 marks)

   Answer space continues on the next two pages.

Turn over

8. **continued.**

8. **continued.**

X = _____

(Total for Question 8 is 4 marks)

Turn over

9. In a sale, normal prices are reduced by **20%**

A bag costs **1080** rupees in the sale.

Work out the normal price of the bag.

(3 marks)

Answer space continues on the next page.

9. **continued.**

_____ **rupees**

(Total for Question 9 is 3 marks)

10. Given that

$$P = 2 \times 3^{43}$$

$$Q = 16 \times 3^{37}$$

(a) Find the highest common factor

(HCF) of **P** and **Q**

(1 mark)

Answer space continues on the

next page.

Turn over

10. (a) continued.

_____

(continued on the next page)

10. continued.

(b) Express the number $P \times Q$ as a product of powers of its prime factors.

Give your answer in its simplest form.

(2 marks)

Answer space continues on the next page.

10. **(b)** **continued.**

_____

(Total for Question 10 is 3 marks)

Turn over

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

It is NOT accurately drawn.

It shows trapezium **ABCD** in which **BC** and **AD** are parallel.

The trapezium has exactly one line of symmetry.

BC = 8·4 cm

AD = 17·6 cm

The trapezium has area **179·4 cm^2**

(continued on the next page)

11. continued.

Work out the size of angle **ABC**

Give your answer correct to

1 decimal place.

(6 marks)

Answer space continues on the next

two pages.

11. continued.

11.   **continued.**

°

_____

(Total for Question 11 is 6 marks)

Turn over

12. **Solve the simultaneous equations**

$$7x - 2y = 34$$
$$3x + 5y = -3$$

Show clear algebraic working.

(4 marks)

Answer space continues on the next two pages.

12. continued.

12. continued.

x = _____

y = _____

(Total for Question 12 is 4 marks)

Turn over

13. Jan invests **$8000** in a savings account.

The account pays compound interest at a rate of **x%** per year.

At the end of **6** years, there is a total of **$8877·62** in the account.

Work out the value of **x**

Give your answer correct to **2** decimal places.

(3 marks)

Answer space continues on the next two pages.

13. continued.

13. continued.

X = _____

(Total for Question 13 is 3 marks)

14. F is inversely proportional to the square of v

Given that $F = 6 \cdot 5$ when $v = 4$

find a formula for F in terms of v

(3 marks)

Answer space continues on the next page.

14. continued.

(Total for Question 14 is 3 marks)

Turn over

15. Look at the diagrams for Question 15 in the Diagram Book.

They show two spinners and an incomplete probability tree diagram.

Harry has two fair **5**–sided spinners, Spinner **A** and Spinner **B**

Harry is going to spin each spinner once.

(a) Complete the probability tree diagram in the Diagram Book.
There are six spaces to fill.
(2 marks)

(continued on the next page)

15. continued.

(b) **Work out the probability that at least one of the spinners will land on green.**

(3 marks)

Answer space continues on the next two pages.

15. (b) continued.

15. (b) continued.

(Total for Question 15 is 5 marks)

Turn over

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

It is NOT accurately drawn.

It shows a circle.

L, M, N and P are points on a circle, centre O

Angle MNP = 58°

(a) (i) Find the size of angle MLP

_____ °

Turn over

16. (a) continued.

    (ii) Give a reason for your

        answer.

(2 marks)

_____

_____

_____

(continued on the next page)

16. continued.

(b) Find the size of the reflex angle

MOP

(2 marks)

_____ °

(Total for Question 16 is 4 marks)

17. A metal block has a mass of **5 kg**, correct to the nearest **50** grams.

The block has a volume of $(1 \cdot 84 \times 10^{-3})$ m^3, correct to **3** significant figures.

Work out the upper bound for the density of the block.

Give your answer in kg/m^3 correct to **1** decimal place.

Show your working clearly.

(4 marks)

Answer space is on the next two pages.

Turn over

17. continued.

17. continued.

_____ **kg/m^3**

(Total for Question 17 is 4 marks)

Turn over

18. The table below gives information about the heights, in centimetres, of some plants.

Height (h cm)	Frequency
10 < h ≤ 20	35
20 < h ≤ 35	45
35 < h ≤ 50	75
50 < h ≤ 70	40
70 < h ≤ 80	10

(continued on the next page)

18. continued.

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

It shows a grid.

(a) Draw a histogram for the information in the table.

(3 marks)

(continued on the next page)

18. continued.

(b) Work out an estimate for the number of these plants with a height greater than **40 cm**

(2 marks)

Answer space continues on the next page.

18. (b) continued.

_____

(Total for Question 18 is 5 marks)

Turn over

19. **Without using a calculator, rationalise the denominator of**

$$\frac{6}{3 - \sqrt{7}}$$

Simplify your answer.

You must show each stage of your working.

(3 marks)

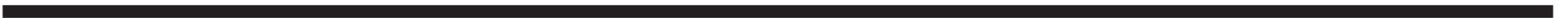**Answer space continues on the next two pages.**

19. **continued.**

19. continued.

_____

(Total for Question 19 is 3 marks)

Turn over

20. **R** and **S** are two similar solid shapes.

Shape **R** has surface area **108 cm^2** and volume **135 cm^3**

Shape **S** has surface area **300 cm^2**

Work out the volume of shape **S**

(3 marks)

Answer space continues on the next page.

20. continued.

_____ **cm^3**

(Total for Question 20 is 3 marks)

21. **Express**

$$\frac{1}{3x-2} \times \frac{9x^2 - 4}{3x^2 - 13x - 10} - \frac{7}{x-1}$$

as a single fraction in its

simplest form.

(5 marks)

Answer space continues on the next

three pages.

21. continued.

21. continued.

21. continued.

(Total for Question 21 is 5 marks)

22. **ABCD** is a rhombus.

The diagonals, **AC** and **BD**, intersect at the point **M**

The coordinates of **M** are $(6, -11)$

The points **A** and **C** both lie on the line with equation $2y + 7x = 20$

Find the exact coordinates of the point where the line through **B** and **D** intersects the **y**−axis.

(4 marks)

Answer space is on the next three pages.

22. **continued.**

22. continued.

22. **continued.**

(_____ , _____)

(Total for Question 22 is 4 marks)

Turn over

23. Curve C has equation $y = px^3 - mx$

where p and m are positive integers.

Find the range of values of x, in terms of p and m, for which the gradient of C is negative.

(4 marks)

Answer space continues on the next two pages.

Turn over

23. continued.

23. continued.

(Total for Question 23 is 4 marks)

Turn over

24. **Here are the first five terms of an arithmetic sequence.**

8   15   22   29   36

Work out the sum of all the terms from the 50th term to the 100th term inclusive.

(4 marks)

Answer space continues on the next three pages.

24. continued.

24. continued.

24. continued.

_____

(Total for Question 24 is 4 marks)

Turn over

25. The curve with equation $y = g(x)$ is transformed to the curve with equation $y = -g(x)$ by the single transformation T

(a) Describe fully the transformation T

(1 mark)

_____

_____

25. continued.

   (b) Look at the diagram for Question 25(b) in the Diagram Book.

   It shows the graph of $y = f(x)$

   On the grid, draw the graph of

   $y = 2f(x - 1)$

   (2 marks)

(Total for Question 25 is 3 marks)

TOTAL FOR PAPER IS 100 MARKS

END OF PAPER