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

Total Marks

Mathematics
PAPER 1 (Non-Calculator)
Higher Tier

Thursday 16 May 2024 – 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						

Q76923A

Pearson

YOU MUST HAVE

Ruler, protractor, pair of compasses, writing and drawing equipment, Formulae Booklet (enclosed). Tracing paper may be used.

YOU WILL BE GIVEN

A separate Diagram Booklet

INSTRUCTIONS

Answer ALL questions.

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.

You must show all your working.

Diagrams are NOT accurately drawn, unless otherwise indicated.

Calculators may not be used.

You may be given cut out shapes for Question 11.

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.

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. Here are the first four terms of an arithmetic sequence.

1 5 9 13

Find an expression, in terms of n, for the nth term of this sequence.

(Total for Question 1 is 2 marks)

2. (a) Work out $3\frac{4}{5} - 1\frac{2}{3}$

(2 marks)

(continued on the next page)

2. continued.

(b) Kevin was asked to work out $2\frac{1}{3} \times \frac{5}{8}$

Here is his working and his answer.

$$2\frac{1}{3} \times \frac{5}{8} = \frac{7}{3} \times \frac{5}{8}$$

$$= \frac{35}{24}$$

$$= 1\frac{9}{24}$$

Kevin's answer is wrong.

What mistake has Kevin made?

(1 mark)

Answer space continues on the next page.

2. (b) continued.

(Total for Question 2 is 3 marks)

3. Look at the diagram for Question 3 in the separate Diagram Booklet.

The diagram is NOT accurately drawn.

The diagram shows a plan of a floor labelled ABCDEF.

In the diagram:

AB = 10 m

BC = 5 m

EF = 6 m

FA = 8 m

Petra is going to cover the floor with paint.

Petra has 3 tins of paint.

There are 2·5 litres of paint in each tin.

Petra thinks 1 litre of paint will cover 10 m^2 of floor.

(continued on the next page)

3. continued.

(a) Assuming Petra is correct, does she have enough paint to cover the floor?

You must show all your working.

(4 marks)

(continued on the next page)

3. continued.

(b) Actually, 1 litre of paint will cover 11 m^2 of floor.

Does this affect your answer to part (a)?

You must give a reason for your answer.

(1 mark)

(Total for Question 3 is 5 marks)

4. Look at the diagram for Question 4 in the separate Diagram Booklet.

The diagram shows a Venn diagram with Set P and Set Q.

(a) Write down the numbers that are in set P'

(1 mark)

_____.

(continued on the next page)

4. continued.

(b) A number is chosen at random from the universal set, ε

Find the probability that this number is in the set $P \cup Q$

(2 marks)

(Total for Question 4 is 3 marks)

5. (a) Sophie drives a distance of 513 kilometres on a motorway in France.

She pays 0·81 euros for every 10 kilometres she drives.

Work out an estimate for the total amount that Sophie pays.

(3 marks)

euros

(continued on the next page)

5. continued.

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

Give a reason for your answer.

(1 mark)

(Total for Question 5 is 4 marks)

6. (a) Look at the diagram for Question 6 in the separate Diagram Booklet.

The diagram shows a straight line **L** drawn on a coordinate grid.

Find an equation for **L**.

(3 marks)

(continued on the next page)

6. continued.

(b) **M** is a different straight line with equation $y = 5x$

Write down the equation of a straight line parallel to **M**.

(1 mark)

(Total for Question 6 is 4 marks)

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7. Kasim has some small jars, some medium jars and some large jars.

He has a total of 400 jars.

$\frac{3}{8}$ of the 400 jars are empty.

For the empty jars,

number of small jars : number of medium jars = 3 : 4

number of medium jars : number of large jars = 1 : 2

Work out the percentage of Kasim's jars that are empty small jars.

(5 marks)

Answer space continues on the next page.

7. continued.

_____%

(Total for Question 7 is 5 marks)

8. Len has 8 parcels.

The mean weight of the 8 parcels is 2·5 kg

The mean weight of 3 of the parcels is 2 kg

Work out the mean weight of the other 5 parcels.

_____ kg

(Total for Question 8 is 3 marks)

9. In a sale, the normal price of a coat is reduced by R%

Given that

sale price = 0·7 × normal price

find the value of R

R = _____

(Total for Question 9 is 1 mark)

10. Solve the simultaneous equations

$$5x - 2y = 23$$

$$2x - 3y = 18$$

(4 marks)

Answer space continues on the next page.

10. continued.

x = _____

y = _____

(Total for Question 10 is 4 marks)

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

The diagram shows Triangle **A** on a coordinate grid.

You may be given cut out shapes for this question.

Triangle **A** is translated by the vector $\begin{pmatrix} 6 \\ -4 \end{pmatrix}$ to give Triangle **B**.

Triangle **B** is rotated $90°$ clockwise about the point $(1, 1)$ to give Triangle **C**.

Describe fully the single transformation that maps Triangle **A** onto Triangle **C**.

(Total for Question 11 is 3 marks)

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

The diagram shows nine graphs labelled **A**, **B**, **C**, **D**, **E**, **F**, **G**, **H**, and **J**.

Write down the letter of the graph that could have the equation

(i) $y = x^2 - 4$

(1 mark)

_____

(ii) $y = -x^3$

(1 mark)

_____

(continued on the next page)

12. continued.

(iii) $y = -\frac{5}{x}$

(1 mark)

(Total for Question 12 is 3 marks)

13. The table below gives information about the amount of time that each of 150 people were in a shop.

Time (t minutes)	Frequency
$0 < t \leq 10$	20
$10 < t \leq 30$	70
$30 < t \leq 35$	20
$35 < t \leq 50$	30
$50 < t \leq 60$	10

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

The diagram shows a grid.

On the grid, draw a histogram for this information.

(3 marks)

(continued on the next page)

13. continued.

Time (t minutes)	Frequency
$0 < t \leq 10$	20
$10 < t \leq 30$	70
$30 < t \leq 35$	20
$35 < t \leq 50$	30
$50 < t \leq 60$	10

(b) Work out an estimate for the fraction of these 150 people who were in the shop for between 20 minutes and 40 minutes.

(2 marks)

(Total for Question 13 is 5 marks)

14. Expand and simplify $(3x - 1)(2x + 3)(x - 5)$

(Total for Question 14 is 3 marks)

15. Look at the diagram for Question 15 in the separate Diagram Booklet.

The diagram is NOT accurately drawn.

The diagram shows a sector of a circle labelled OAB, with centre O and radius 6 cm

OA = 6 cm

OB = 6 cm

The length of the arc AB is 5π cm

Work out, in terms of π, the area of the sector.

Give your answer in its simplest form.

(4 marks)

Answer space continues on the next page.

15. continued.

cm^2

(Total for Question 15 is 4 marks)

16. There are only n orange sweets and 1 white sweet in a bag.

Saira takes at random a sweet from the bag and eats the sweet.
She then takes at random another sweet from the bag and eats this sweet.

Show that the probability that Saira eats two orange sweets is $\frac{n-1}{n+1}$

(Total for Question 16 is 2 marks)

17. (a) Rationalise the denominator of $\frac{1}{\sqrt{7}}$

(1 mark)

(b) Simplify fully $\sqrt{80} - \sqrt{5}$

(2 marks)

(Total for Question 17 is 3 marks)

18. Show that $0\dot{1}\dot{5} + 0\dot{2}\dot{7}$ can be written in the form $\frac{m}{66}$ where m is an integer.

(3 marks)

Answer space continues on the next page.

18. continued.

(Total for Question 18 is 3 marks)

19. Look at the diagram for Question 19 in the separate Diagram Booklet.

The diagram is NOT accurately drawn.

The diagram shows two similar isosceles triangles, **ABC** and **DAB**.

AB = AC

AD = BD

BC : CD = 4 : 21

Find the ratio **AB : AD**

(3 marks)

Answer space continues on the next page.

19. continued.

(Total for Question 19 is 3 marks)

20. $2^x = \frac{2^n}{\sqrt[3]{2}}$ $\quad$ $2^y = \left(\sqrt{2}\right)^5$

Given that $x + y = 8$

work out the value of n.

$n =$ _____

(Total for Question 20 is 3 marks)

21. A solid cuboid has a volume of $300\ cm^3$

The cuboid has a total surface area of $370\ cm^2$

The length of the cuboid is $20\ cm$

The width of the cuboid is greater than the height of the cuboid.

Work out the height of the cuboid.

You must show all your working.

(5 marks)

Answer space continues on the next page.

21. continued.

_____ cm

(Total for Question 21 is 5 marks)

22. (a) Look at the diagram for Question 22 in the separate Diagram Booklet.

The diagram shows two axes.

On the axes, sketch the graph of $y = \sin x^\circ$ for $0 \leq x \leq 360$

(2 marks)

(b) Solve the equation below

$2 \sin x^\circ = -1$ for $0 \leq x \leq 360$

(2 marks)

(Total for Question 22 is 4 marks)

23. **C** is a circle with centre **(0, 0)**

L is a straight line.

The circle **C** and the line **L** intersect at the points **P** and **Q**.

The coordinates of **P** are **(5, 10)**

The **x** coordinate of **Q** is **–2**

L has a positive gradient and crosses the **y**-axis at the point **(0, k)**

Find the value of **k**.

(5 marks)

Answer space continues on the next page.

23. continued.

$k =$ _____

(Total for Question 23 is 5 marks)

TOTAL FOR PAPER IS 80 MARKS

END OF PAPER