

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

Total Marks

Mathematics

Paper 2

(Calculator)

Higher Tier

Thursday 6 June 2019 – Morning

**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					

Y54214A

YOU MUST HAVE

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

YOU WILL BE GIVEN

Diagram Book

Turn over

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 and models are NOT accurate unless otherwise indicated.

CALCULATORS MAY BE USED.

If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

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 a model for Question 19

There may be spare copies of some diagrams.

Turn over

ADVICE

Read each question carefully before you start to answer it.

Keep an eye on the time.

Try to answer every question.

Check your answers if you have time at the end.

Turn over

6

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

Turn over

1. (a) Solve

$$14n > 11n + 6$$

(2 marks)

(continued on the next page)

Turn over

1. continued.

**(b) Look at the diagram for
Question 1(b) in the
Diagram Book.**

**On the number line, show the set
of values of x for which**

$$\mathbf{-2 < x + 3 \leq 4}$$

(3 marks)

(Total for Question 1 is 5 marks)

Turn over

- 2. Look at the diagram for Question 2 in the Diagram Book.**

**On the grid, draw the graph of
 $y = 2x - 3$ for values of x
from -2 to 4**

(Total for Question 2 is 3 marks)

Turn over

- 3. Look at the table for Question 3 in the Diagram Book.**

Hannah is planning a day trip for 195 students.

She asks a sample of 30 students where they want to go.

Each student chooses one place.

The table shows information about her results.

(continued on the next page)

3. continued.

**(i) Work out how many of the
195 students you think will want
to go to the Theme Park.**

(2 marks)

**Answer space continues on the
next page.**

Turn over

3. (i) continued.

(continued on the next page)

Turn over

3. continued.

**(ii) State any assumption you made
AND explain how this may affect
your answer.**

(1 mark)

(Total for Question 3 is 3 marks)

Turn over

- 4. Look at the diagram for Question 4 in the Diagram Book.**

It shows a container in the shape of a cuboid, with length 30 cm, width 6 cm, and height 19 cm

The container is $\frac{2}{3}$ full of water.

A cup holds 275 ml of water.

What is the greatest number of cups that can be completely filled with water from the container?

(4 marks)

Answer space is on the next two pages.

Turn over

4. continued.

Turn over

4. continued.

(Total for Question 4 is 4 marks)

Turn over

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

ABC is a right-angled triangle.

AC = 16 cm

Angle ACB = 38°

Angle ABC is a right angle.

Calculate the length of AB

Give your answer correct to

2 decimal places.

(2 marks)

Answer space continues on the next page.

Turn over

5. continued.

_____ **cm**

(Total for Question 5 is 2 marks)

Turn over

6. Sally used her calculator to work out the value of a number y

The answer on her calculator display began

8.3

Complete the error interval for y

_____ $\leq y <$ _____

(Total for Question 6 is 2 marks)

Turn over

7. **£360** is shared between Abby, Ben, Chloe and Denesh.

The ratio of the amount Abby gets to the amount Ben gets is **2 : 7**

Chloe and Denesh each get **1.5** times the amount Abby gets.

Work out the amount of money that Ben gets.

(4 marks)

Answer space continues on the next two pages.

7. continued.

Turn over

7. continued.

£ _____

(Total for Question 7 is 4 marks)

Turn over

8. (a) Write

0.00562 in standard form.

(1 mark)

(b) Write

1.452×10^3 as an ordinary
number.

(1 mark)

(Total for Question 8 is 2 marks)

Turn over

9. The circumference of circle **B** is **90%** of the circumference of circle **A**

- (a) Find the ratio of the area of circle **A** to the area of circle **B**
(2 marks)

Answer space continues on the next page.

9. (a) continued.

(continued on the next page)

Turn over

9. continued.

Square **E** has sides of length **e cm**

Square **F** has sides of length **f cm**

The area of square **E** is **44%** greater than the area of square **F**

(b) Work out the ratio **e : f**

(2 marks)

Answer space continues on the next page.

Turn over

9. (b) continued.

(Total for Question 9 is 4 marks)

Turn over

10. Mary travels to work by train every day.

The probability that her train will be late on any day is 0.15

(a) Look at the diagram for Question 10(a) in the Diagram Book.

**Complete the probability tree diagram for Thursday and Friday.
There are five spaces to fill.
(2 marks)**

(continued on the next page)

10. continued.

(b) Work out the probability that her train will be late on at least one of these two days.

(3 marks)

Answer space continues on the next page.

Turn over

30

10. (b) continued.

(Total for Question 10 is 5 marks)

Turn over

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

The grouped frequency table gives information about the times, in minutes, that 80 office workers take to get to work.

(continued on the next page)

11. continued.

(a) Complete the cumulative frequency table below.

There are six spaces to fill.

(1 mark)

Time (t minutes)	Cumulative frequency
$0 < t \leq 20$	
$0 < t \leq 40$	
$0 < t \leq 60$	
$0 < t \leq 80$	
$0 < t \leq 100$	
$0 < t \leq 120$	

(continued on the next page)

Turn over

11. continued.

**(b) Look at the diagram for
Question 11(b) in the
Diagram Book.**

**On the grid, draw the cumulative
frequency graph for this
information.**

(2 marks)

(continued on the next page)

Turn over

11. continued.

(c) Use your graph to find an estimate for the percentage of these office workers who take more than 90 minutes to get to work.

(3 marks)

Answer space continues on the next page.

Turn over

35

11. (c) continued.

_____ %

(Total for Question 11 is 6 marks)

Turn over

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

OAB is a sector of a circle with centre **O** and radius **7 cm**

The area of the sector is **40 cm^2**

Calculate the perimeter of the sector.

Give your answer correct to

3 significant figures.

(4 marks)

Answer space continues on the next two pages.

12. continued.

Turn over

12. continued.

_____ cm

(Total for Question 12 is 4 marks)

Turn over

13. Show that

$$6 + \left[(x + 5) \div \frac{x^2 + 3x - 10}{x - 1} \right]$$

simplifies to $\frac{ax - b}{cx - d}$

where **a**, **b**, **c** and **d** are integers.

(4 marks)

Answer space continues on the next three pages.

Turn over

13. continued.

Turn over

13. continued.

Turn over

13. continued.

(Total for Question 13 is 4 marks)

Turn over

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

It shows a graph.

A car moves from rest.

The graph gives information about the speed, v metres per second, of the car t seconds after it starts to move.

(a) (i) Calculate an estimate of the gradient of the graph at $t = 15$

(3 marks)

Answer space is on the next page.

Turn over

14. (a) (i) continued.

(continued on the next page)

Turn over

14. (a) continued.

**(ii) Describe what your answer
to part (i) represents.**

(1 mark)

(continued on the next page)

14. continued.

(b) Work out an estimate for the distance the car travels in the first 20 seconds of its journey.

Use 4 strips of equal width.

(3 marks)

Answer space continues on the next page.

Turn over

14. (b) continued.

_____ metres

(Total for Question 14 is 7 marks)

Turn over

15. Make m the subject of the formula

$$f = \frac{3m + 4}{m - 1}$$

(3 marks)

Answer space continues on the next page.

Turn over

15. continued.

(Total for Question 15 is 3 marks)

Turn over

16. The straight line **L** has the equation
 $3y = 4x + 7$

The point **A** has coordinates $(3, -5)$

Find an equation of the straight line
that is perpendicular to **L** and passes
through **A**

(3 marks)

Answer space continues on the next
two pages.

16. continued.

Turn over

16. continued.

(Total for Question 16 is 3 marks)

Turn over

17. There are some small cubes and some large cubes in a bag.

The cubes are red or the cubes are yellow.

The ratio of the number of small cubes to the number of large cubes is $4:7$

The ratio of the number of red cubes to the number of yellow cubes is $3:5$

(continued on the next page)

17. continued.

- (a) Explain why the least possible number of cubes in the bag is 88 (1 mark)**

(continued on the next page)

Turn over

17. continued.

All the small cubes are yellow.

**(b) Work out the least possible
number of large yellow cubes in
the bag.**

(3 marks)

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

Turn over

17. (b) continued.

Turn over

17. (b) continued.

(Total for Question 17 is 4 marks)

Turn over

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

The points **A**, **B**, **C** and **D** lie on a circle.

CDE is a straight line.

$$BA = BD$$

$$CB = CD$$

$$\text{Angle } ABD = 40^\circ$$

Work out the size of angle **ADE**

You must give a reason for each stage of your working.

(5 marks)

Answer space is on the next two pages.

Turn over

18. continued.

Turn over

18. continued.

(Total for Question 18 is 5 marks)

Turn over

19. Look at the diagrams for Question 19 in the Diagram Book.

You may be provided with a model.

It is not accurate.

Diagram 1 shows a triangular prism.

The base, $ABCD$, of the prism is a square of side length 15 cm , shown in diagram 1a

Angle ABE and angle CBE are right angles.

Angle $EAB = 35^\circ$

Diagram 1b shows the face ABE

(continued on the next page)

19. continued.

M is the point on **DA** such that

$$\mathbf{DM : MA = 2 : 3}$$

Diagram 1c shows triangle MBE

**Calculate the size of the angle
between EM and the base of the
prism.**

**Give your answer correct to
1 decimal place.**

(4 marks)

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

Turn over

19. continued.

Turn over

19. continued.

○

(Total for Question 19 is 4 marks)

Turn over

20. Look at diagram 1 for Question 20 in the Diagram Book.

CDEF is a quadrilateral.

$$\overrightarrow{CD} = \mathbf{a}, \overrightarrow{DE} = \mathbf{b} \text{ and } \overrightarrow{FC} = \mathbf{a} - \mathbf{b}$$

(a) Express \overrightarrow{FE} in terms of **a** and/or **b**

Give your answer in its simplest form.

(2 marks)

(continued on the next page)

Turn over

20. continued.

**Below diagram 1, diagram 2 shows
the same quadrilateral CDEF**

M is the midpoint of DE

X is the point on FM such that

$$\mathbf{FX : XM = n : 1}$$

CXE is a straight line.

(b) Work out the value of n

(4 marks)

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

Turn over

20. (b) continued.

Turn over

20. (b) continued.

$n =$ _____

(Total for Question 20 is 6 marks)

TOTAL FOR PAPER IS 80 MARKS

END OF PAPER
