

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

Total Marks
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**Mathematics**  
**PAPER 2**  
**(Calculator)**  
**Higher Tier**

**Time: 1 hour 30 minutes plus your additional time allowance**

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

<b>Surname</b>					
<b>Other names</b>					
<b>Centre Number</b>					
<b>Candidate Number</b>					

**Y64632A**

**YOU MUST HAVE**

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

**YOU WILL BE GIVEN**

**Diagram Booklet**

**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 are NOT accurately drawn, unless otherwise indicated.**

**CALCULATORS MAY BE USED.**

**If your calculator does not have a  $\pi$  button, take the value of  $\pi$  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.**

**There may be spare copies of some diagrams in case you need them.**

## **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.**

**5**

**Answer ALL questions.**

**Write your answers in the spaces provided.**

**You must write down all the stages in your working.**

**Turn over**

- 1. (a) Look at the diagram for Question 1(a) in the Diagram Booklet.**

**It shows a number line.**

**Write down the inequality shown on the number line.**

**(1 mark)**

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**(continued on the next page)**

**Turn over**

**1. continued.**

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

**It shows a blank number line.**

**On the number line, show the  
inequality**

$$\mathbf{-3 \leq y < 4}$$

**(2 marks)**

**(Total for Question 1 is 3 marks)**

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**Turn over**

- 2. (a) Find the Highest Common Factor (HCF) of 60 and 84**  
**(2 marks)**

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



**2. (a) continued.**

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**(continued on the next page)**

**Turn over**

**2. continued.**

**(b) Find the Lowest Common  
Multiple (LCM) of 24 and 40  
(2 marks)**

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

**Turn over**

**2. (b) continued.**

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**(Total for Question 2 is 4 marks)**

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**Turn over**

- 3. Look at the diagram for Question 3 in the Diagram Booklet.**

**Sam drives his car on a journey.**

**The travel graph for the first 15 minutes of his journey is shown in the Diagram Booklet.**

- (a) Work out Sam's speed, in km/h, for the first 15 minutes of his journey.**  
**(2 marks)**

\_\_\_\_\_ km/h

**(continued on the next page)**

**Turn over**

**3. continued.**

**At 10 15 Sam stops for 10 minutes  
and then drives for 20 minutes at a  
speed of 75 km/h**

**(b) On the grid in the  
Diagram Booklet, complete the  
travel graph for Sam's journey.  
(3 marks)**

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

**Turn over**

**3. (b) continued.**

**(Total for Question 3 is 5 marks)**

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**Turn over**

4. (a) On the next page complete the table of values for

$$y = x^2 - 2x + 2$$

There are four spaces to fill.

(2 marks)

4. (a) continued.

<b>x</b>	<b>y</b>
<b>-2</b>	<b>10</b>
<b>-1</b>	
<b>0</b>	<b>2</b>
<b>1</b>	
<b>2</b>	
<b>3</b>	<b>5</b>
<b>4</b>	

(continued on the next page)

Turn over



**4. continued.**

**(b) Look at the diagram for  
Question 4(b) in the  
Diagram Booklet.**

**It shows a grid.**

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

**(2 marks)**

**(continued on the next page)**

**Turn over**

**4. continued.**

**(c) Use your graph to find estimates  
of the solutions of the equation**

$$x^2 - 2x + 2 = 4$$

**(2 marks)**

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**(Total for Question 4 is 6 marks)**

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**Turn over**

5. Look at Diagram 1 and Diagram 2 for Question 5 in the Diagram Booklet.

Diagram 1 shows a right-angled triangle labelled shape **A** with a base length of **10 mm** and a vertical height of **8 mm**

Diagram 2 is a shaded shape made from two shape **A** triangles.

Work out the perimeter of the shaded shape in Diagram 2

Give your answer correct to 3 significant figures.

(4 marks)

Answer space is on the next two pages.

Turn over

**5. continued.**

**Turn over**

**5. continued.**

\_\_\_\_\_ mm

**(Total for Question 5 is 4 marks)**

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**Turn over**

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

It shows a right-angled triangle, **ABC**

$$AC = 12 \text{ cm}$$

$$\text{Angle } BAC = 56^\circ$$

Angle **ACB** is a right angle.

- (a) Work out the length of **BC**

Give your answer correct to  
1 decimal place.

(2 marks)

Answer space continues on the  
next page.

Turn over

6. (a) continued.

\_\_\_\_\_ cm

(continued on the next page)

Turn over

**6. continued.**

**Look at the diagram for Question 6(b)  
in the Diagram Booklet.**

**It shows a right-angled triangle, PQR**

**$PR = 18 \text{ cm}$**

**$RQ = 15 \text{ cm}$**

**Angle PQR is a right angle.**

**Angle PRQ is marked  $x$**

**(b) Work out the size of the angle  
marked  $x$**

**Give your answer correct to**

**1 decimal place.**

**(2 marks)**

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

**Turn over**



6. (b) continued.

o

(Total for Question 6 is 4 marks)

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Turn over

7. Liquid **A** has a density of  $1.8 \text{ g/cm}^3$   
Liquid **B** has a density of  $1.2 \text{ g/cm}^3$

$80 \text{ cm}^3$  of liquid **A** is mixed with  
 $40 \text{ cm}^3$  of liquid **B** to make  
 $120 \text{ cm}^3$  of liquid **C**

Work out the density of liquid **C**  
(3 marks)

Answer space continues on the next  
page.

7. continued.

\_\_\_\_\_ g/cm<sup>3</sup>

(Total for Question 7 is 3 marks)

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Turn over

- 8. Look at Table 1 and Table 2 for Question 8 in the Diagram Booklet. Table 1 is a grouped frequency table which gives information about the time, in minutes, taken by 50 people to solve a puzzle.**

**Brian was asked to draw a cumulative frequency table for this information.**

**(continued on the next page)**

**8. continued.**

**Brian drew Table 2**

**Write down ONE thing that is wrong  
with the cumulative frequency table.**

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**(Total for Question 8 is 1 mark)**

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**Turn over**

- 9. Look at the diagram for Question 9 in the Diagram Booklet.**

**It is a box plot which shows information about the length of time, in minutes, some people waited to see a doctor at a hospital on Monday.**

- (a) Work out the interquartile range of the information in the box plot.  
(2 marks)**

**\_\_\_\_\_ minutes**

**(continued on the next page)**

**Turn over**

9. continued.

Becky says,

“50% of the people waited for at least 2 hours.”

(b) Is Becky correct?

Explain why.

(1 mark)

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(continued on the next page)

Turn over

**9. continued.**

**Look at the table for Question 9(c) in the Diagram Booklet.**

**It is shown below the box plot.**

**It gives information about the length of time, in minutes, some people waited to see a doctor at the same hospital on Tuesday.**

**Becky was asked to compare the distribution of the lengths of times people waited on Monday with the distribution of the lengths of times people waited on Tuesday.**

**(continued on the next page)**

**Turn over**



**9. continued.**

**She wrote,**

**“People had to wait longer on  
Tuesday than on Monday.”**

**(c) Give ONE reason why Becky may  
be wrong.**

**(1 mark)**

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**(Total for Question 9 is 4 marks)**

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**Turn over**

**10. Look at the information for  
Question 10 in the Diagram Booklet.**

**Louise invests £X in**

**Better Investments for 3 years.**

**Sadiq invests £X in County Bank for  
3 years.**

**At the end of the 3 years, the value of  
Louise's investment is £344 605**

**Work out the value of Sadiq's  
investment at the end of the 3 years.**

**(4 marks)**

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

**Turn over**

**10. continued.**

**Turn over**

10. continued.

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**(Total for Question 10 is 4 marks)**

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**Turn over**

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

**It shows a sketch of the line  $L$**

**The points  $P(-6, 0)$  and  $Q(0, 3)$  are points on the line  $L$**

**The point  $R$  is such that  $PQR$  is a straight line and  $PQ : QR = 2 : 3$**

**(a) Find the coordinates of  $R$   
(2 marks)**

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

**Turn over**

11. (a) continued.

( \_\_\_\_\_ , \_\_\_\_\_ )

(continued on the next page)

Turn over

**11. continued.**

- (b) Find an equation of the line that is perpendicular to  $L$  and passes through  $Q$**   
**(3 marks)**

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**(Total for Question 11 is 5 marks)**

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**Turn over**

**12. Expand and simplify**

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

**(3 marks)**

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



**12. continued.**

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**(Total for Question 12 is 3 marks)**

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**Turn over**

**13. In a school there are 16 teachers and 220 students.**

**Of these students 120 are girls and 100 are boys.**

**One teacher, one girl and one boy are going to be chosen to represent the school.**

**Work out the number of different ways there are to choose one teacher, one girl and one boy.**

**(2 marks)**

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

**13. continued.**

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**(Total for Question 13 is 2 marks)**

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**Turn over**

**14. Look at the diagram for Question 14 in the Diagram Booklet.**

**A, B, C and D are four points on a circle.**

**SBT is a tangent to the circle.**

**Angle ABD =  $20^\circ$**

**the size of angle BAD : the size of angle BCD = 3 : 1**

**Find the size of angle SBA**

**Give a reason for each stage of your working.**

**(4 marks)**

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

**Turn over**

14. continued.

Turn over

**14. continued.**

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**(Total for Question 14 is 4 marks)**

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**Turn over**

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

**It shows the triangle ABC**

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

$$\mathbf{AB = 11\text{ cm}}$$

$$\mathbf{\text{Angle CAB} = 72^\circ}$$

**(a) Find the length of BC**

**Give your answer correct to  
3 significant figures.**

**(3 marks)**

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

**Turn over**

15. (a) continued.

\_\_\_\_\_ cm

(continued on the next page)

Turn over



**15. continued.**

**(b) Find the area of triangle ABC**

**Give your answer correct to**

**3 significant figures.**

**(2 marks)**

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

**Turn over**

**50**

**15. (b) continued.**

\_\_\_\_\_ **cm<sup>2</sup>**

**(Total for Question 15 is 5 marks)**

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**Turn over**

16. (a) Use the iteration formula

$$x_{n+1} = \sqrt[3]{10 - 2x_n}$$

to find the values of  $x_1$ ,  $x_2$   
and  $x_3$

Start with  $x_0 = 2$

(3 marks)

Answer space continues on the  
next two pages.

16. (a) continued.

Turn over

16. (a) continued.

$$x_1 = \underline{\hspace{10cm}}$$

$$x_2 = \underline{\hspace{10cm}}$$

$$x_3 = \underline{\hspace{10cm}}$$

(continued on the next page)

Turn over

**16. continued.**

The values of  $x_1$ ,  $x_2$  and  $x_3$  found in part (a) are estimates of the solution of an equation of the form  $x^3 + ax + b = 0$  where  $a$  and  $b$  are integers.

**(continued on the next page)**

**Turn over**

**16. continued.**

- (b) Find the value of  $a$  and the value of  $b$**   
**(1 mark)**

**$a =$  \_\_\_\_\_**

**$b =$  \_\_\_\_\_**

**(Total for Question 16 is 4 marks)**

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**Turn over**

**17. Look at the diagram for Question 17 in the Diagram Booklet.**

**It shows a histogram.**

**Some people took part in the first round of a competition.**

**The histogram gives information about the scores of these people in the first round.**

**20% of the people got a score high enough for them to qualify for the second round.**

**(continued on the next page)**

**Turn over**



**17. continued.**

**Work out an estimate for the score needed to qualify for the second round.**

**You must show all your working.**

**(4 marks)**

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

**Turn over**

17. continued.

Turn over

**17. continued.**

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**(Total for Question 17 is 4 marks)**

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**Turn over**

**18. Look at the diagram for Questions 18(a) and 18(b) in the Diagram Booklet.**

**It shows a graph of  $y = \sin x^\circ$  for  $0 \leq x \leq 360$**

**(a) Using the graph, find estimates of all FOUR solutions of**

$$\sin x^\circ = 0.6 \quad \text{for } 0 \leq x \leq 720$$

**(2 marks)**

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**(continued on the next page)**

**Turn over**

**18. continued.**

**The graph of  $y = \sin x^\circ$  is reflected  
in the  $X$ -axis.**

**(b) Write down an equation of the  
reflected graph.**

**(1 mark)**

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**(continued on the next page)**

**Turn over**

**18. continued.**

**Look at the diagram for Question 18(c)  
in the Diagram Booklet.**

**It shows a graph of  $y = f(x)$**

- (c) On the grid, draw the graph of  
 $y = f(x - 2)$   
(1 mark)**

**(Total for Question 18 is 4 marks)**

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**Turn over**

19. **A**, **B** and **C** are three spheres.

The volume of sphere **A** is  $125 \text{ cm}^3$

The volume of sphere **B** is  $27 \text{ cm}^3$

The ratio of the radius of sphere **B** to the radius of sphere **C** is  $1 : 2$

Work out the ratio of the surface area of sphere **A** to the surface area of sphere **C**

(3 marks)

Answer space continues on the next two pages.

Turn over

**19. continued.**

**Turn over**



**19. continued.**

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**(Total for Question 19 is 3 marks)**

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**Turn over**

**20. In a village,**

**if it rains on one day, the probability  
that it will rain on the next day is  $0.8$**

**if it does NOT rain on one day, the  
probability that it will rain on the  
next day is  $0.6$**

**A weather forecaster says,**

**“There is a  $70\%$  chance that it will  
rain in the village on Monday.”**

**(continued on the next page)**

**Turn over**

**20. continued.**

**Work out an estimate for the probability that it will rain in the village on Wednesday.**

**You must show all your working.**

**(4 marks)**

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

**Turn over**

**20. continued.**

**Turn over**

**20. continued.**

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**(Total for Question 20 is 4 marks)**

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**Turn over**

21. The time period,  $T$  seconds, of a simple pendulum of length  $L$  cm is given by the formula

$$T = 2\pi\sqrt{\frac{L}{g}}$$

Katie uses a simple pendulum in an experiment to find an estimate for the value of  $g$

Here are her results.

$L = 52.0$  correct to  
3 significant figures.

$T = 1.45$  correct to  
3 significant figures.

(continued on the next page)

Turn over

**21. continued.**

**Work out the upper bound and the lower bound for the value of  $g$**

**Use  $\pi = 3.142$**

**You must show all your working.**

**(4 marks)**

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

**Turn over**

**21. continued.**

**Turn over**



**21. continued.**

**upper bound = \_\_\_\_\_**

**lower bound = \_\_\_\_\_**

**(Total for Question 21 is 4 marks)**

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**TOTAL FOR PAPER IS 80 MARKS**

**END OF PAPER**

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