

**Paper Reference 4MA1/1H  
Pearson Edexcel  
International GCSE**

Total Marks

**Mathematics A**

**Level 1/2**

**Paper 1H**

**(Calculator)**

**Higher Tier**

**Monday 7 January 2019 – Morning**

**Time: 2 hours 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>					

**Y59017A**

**2**

**YOU MUST HAVE**

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

**YOU WILL BE GIVEN**

**Diagram Book**

**Formulae Pages**

**Shapes for Question 2(a), 2(b) and 2(c)**

**Turn over**

## **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.**

**Turn over**

## **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.**

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**5**

**Answer ALL TWENTY ONE  
questions.**

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

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

**Turn over**

**6**

**1. (a) Factorise fully**

$$4p + 6pq$$

**(2 marks)**

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**(continued on the next page)**

**Turn over**

**1. continued.**

**(b) Expand and simplify**

$$(e + 3)(e - 5)$$

**(2 marks)**

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**(continued on the next page)**

**Turn over**

1. continued.

(c) Solve

$$y = \frac{2y + 1}{5}$$

Show clear algebraic working.

(3 marks)

Answer space continues on the  
next page.

Turn over

1. (c) continued.

$$y = \underline{\hspace{10em}}$$

**(Total for Question 1 is 7 marks)**

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**Turn over**

**2. Look at the diagram for Question 2(a) and (b) in the Diagram Book.**

**It shows triangle A and triangle B on a coordinate grid.**

**A cut out shape is available if you wish to use it.**

**(a) Describe fully the single transformation that maps triangle A onto triangle B (3 marks)**

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**(continued on the next page)**

**2. continued.**

**(b) On the grid, translate triangle A  
by the vector**

$$\begin{pmatrix} 2 \\ -5 \end{pmatrix}$$

**Label the new triangle C**

**(1 mark)**

**(continued on the next page)**

**Turn over**

2. continued.

(c) Look at the diagram for Question 2(c) in the Diagram Book. It shows triangle **D** and triangle **E** on a coordinate grid.

Describe fully the single transformation that maps triangle **D** onto triangle **E**

Two cut out shapes are available if you wish to use them.

(2 marks)

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(Total for Question 2 is 6 marks)

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Turn over

- 3. Look at the diagram and at the table for Question 3 in the Diagram Book. The diagram shows a biased 5-sided spinner.**

**When the spinner is spun, it can land on red, blue, green, brown or yellow.**

**The table in the Diagram Book gives the probabilities that the spinner lands on red or on blue or on green.**

**(continued on the next page)**

**3. continued.**

**When the spinner is spun once, the probability that the spinner lands on brown is  $0.06$  more than the probability that the spinner lands on yellow.**

**Jenine spins the spinner  $150$  times.**

**Work out an estimate for the number of times the spinner lands on yellow.**

**(4 marks)**

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

**3. continued.**

**3. continued.**

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**(Total for Question 3 is 4 marks)**

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**4. Look at the table for Question 4 in the Diagram Book.**

**It gives information about the price of gold.**

**(a) Work out the percentage increase in the price of gold between 1st February 2016 and 1st March 2016**

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

**(3 marks)**

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

4. (a) continued.

\_\_\_\_\_ %

(continued on the next page)

Turn over

**4. continued.**

**The price of one ounce of gold on  
1st February 2016 was  
1126·50 dollars.**

**The price of gold increased by 19%  
from 1st February 2016 to  
1st July 2016**

**(b) Work out the price of one ounce  
of gold on 1st July 2016**

**Give your answer correct to the  
nearest dollar.**

**(3 marks)**

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

**Turn over**

**20**

**4. (b) continued.**

\_\_\_\_\_ **dollars**

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

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**Turn over**

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

It is NOT accurately drawn.

**BCD** and **AFE** are straight lines.

$$\text{Angle BCF} = (4y + 15)^\circ$$

$$\text{Angle DCF} = (30y - 5)^\circ$$

$$\text{Angle CFA} = (20y + 45)^\circ$$

Show that **BCD** is parallel to **AFE**

Give reasons for your working.

(5 marks)

Answer space continues on the next two pages.

5. continued.

Turn over

**5. continued.**

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

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**Turn over**

6. (a) Complete the table of values below for  $y = x^2 - 5x + 6$

There are two spaces to fill.

(1 mark)

<b>x</b>	<b>y</b>
<b>0</b>	<b>6</b>
<b>1</b>	
<b>2</b>	<b>0</b>
<b>3</b>	<b>0</b>
<b>4</b>	<b>2</b>
<b>5</b>	

(continued on the next page)

Turn over

**6. continued.**

**(b) Look at the diagram for**

**Question 6 in the Diagram Book.**

**On the grid, draw the graph of**

$$y = x^2 - 5x + 6 \text{ for } 0 \leq x \leq 5$$

**(2 marks)**

**(c) By drawing a suitable straight**

**line on the grid, find estimates**

**for the solutions of the equation**

$$x^2 - 5x = x - 7$$

**(3 marks)**

**Answer space continues on the**

**next page.**

**Turn over**

6. (c) continued.



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



**Turn over**

7. Look at the table for Question 7 in the Diagram Book.

It shows the volumes, in  $\text{km}^3$ , of four oceans.

- (a) Write  $7.18 \times 10^7$  as an ordinary number.  
(1 mark)
- 

(continued on the next page)

Turn over

7. continued.

(b) Calculate the total volume of these four oceans.

(2 marks)

\_\_\_\_\_ km<sup>3</sup>

(continued on the next page)

Turn over

7. continued.

The volume of the South China Sea  
is **9 880 000 km<sup>3</sup>**

(c) Write **9 880 000** in standard  
form.

(1 mark)

  

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**(Total for Question 7 is 4 marks)**

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**Turn over**

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

It is NOT accurately drawn.

It shows an isosceles triangle, **ABC**

$$AB = AC = x \text{ cm}$$

$$BC = 5 \text{ cm}$$

The area of the triangle is  $12 \text{ cm}^2$

Work out the perimeter of the triangle.

Give your answer correct to 3 significant figures.

(4 marks)

Answer space is on the next two pages.

Turn over

**8. continued.**

**Turn over**

8. continued.

\_\_\_\_\_ cm

**(Total for Question 8 is 4 marks)**

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**Turn over**

**9. Look at the table for Question 9 in the Diagram Book.**

**It shows information about the speeds of 60 cycles.**

**(continued on the next page)**

9. continued.

(a) Complete the cumulative frequency table below.

(1 mark)

<b>Speed (s km/h)</b>	<b>Cumulative frequency</b>
<b><math>0 &lt; s \leq 10</math></b>	
<b><math>0 &lt; s \leq 20</math></b>	
<b><math>0 &lt; s \leq 30</math></b>	
<b><math>0 &lt; s \leq 40</math></b>	
<b><math>0 &lt; s \leq 50</math></b>	
<b><math>0 &lt; s \leq 60</math></b>	

(continued on the next page)

Turn over

**9. continued.**

**(b) Look at the diagram for Question 9(b) and (c) in the Diagram Book.**

**On the grid, draw a cumulative frequency graph for your table.  
(2 marks)**

**(c) Use your graph to find an estimate for the interquartile range of the speeds.  
(2 marks)**

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

9. (c) continued.

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

(Total for Question 9 is 5 marks)

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10. Look at the diagram for Question 10  
in the Diagram Book.

It is NOT accurately drawn.

It shows triangle **ABD**

The point **C** lies on **BD**

**AD = 13 cm**

**BC = 8 cm**

angle **ADB = 90°**

angle **CAD = 20°**

(continued on the next page)

10. continued.

Calculate the size of angle **BAC**

Give your answer correct to

**1** decimal place.

(5 marks)

Answer space continues on the next  
two pages.

Turn over

**10. continued.**

**Turn over**

40

10. continued.

○

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**(Total for Question 10 is 5 marks)**

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**Turn over**

11. Express

$$\frac{5}{3} - \frac{y + 2}{2y}$$

as a single fraction in its simplest terms.

(3 marks)

Answer space continues on the next two pages.

Turn over

11. continued.

Turn over

11. continued.

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**(Total for Question 11 is 3 marks)**

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**Turn over**

12. The curve **C** has equation

$$y = \frac{1}{3}x^3 - 9x + 1$$

(a) Find  $\frac{dy}{dx}$

(2 marks)

Answer space continues on the  
next page.

Turn over

12. (a) continued.

$$\frac{dy}{dx} = \underline{\hspace{2cm}}$$

(continued on the next page)

Turn over

**12. continued.**

**(b) Find the range of values of  $X$  for which  $C$  has a negative gradient.**

**(3 marks)**

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

**Turn over**

12. (b) continued.

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**(Total for Question 12 is 5 marks)**

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**Turn over**

**13. Look at the diagram for Question 13 in the Diagram Book.**

**It shows an incomplete Venn diagram.**

**All the students in Year 11 at a school must study at least one of Geography (set **G**), History (set **H**) and Religious Studies (set **R**)**

**(continued on the next page)**

**13. continued.**

**In Year 11 there are 65 students.**

**Of these students**

**15 study Geography, History and Religious Studies**

**21 study Geography and History**

**16 study Geography and Religious Studies**

**30 study Geography**

**18 study only Religious Studies**

**37 study Religious Studies**

**(continued on the next page)**

**13. continued.**

- (a) Using this information, complete the Venn diagram to show the number of students in each region of the Venn diagram.**  
**(3 marks)**

**A student in Year 11 who studies both History and Religious Studies is chosen at random.**

- (b) Work out the probability that this student does NOT study Geography.**  
**(2 marks)**

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

**Turn over**

13. (b) continued.

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**(Total for Question 13 is 5 marks)**

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**Turn over**

14. **T** is directly proportional to the cube of **r**

$$T = 21.76 \text{ when } r = 4$$

- (a) Find a formula for **T** in terms of **r**  
(3 marks)

Answer space continues on the next page.

**14. (a) continued.**



**(continued on the next page)**

**Turn over**

14. continued.

(b) Work out the value of  $T$  when

$$r = 6$$

(1 mark)

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

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**Turn over**

15. The total surface area of a solid hemisphere is equal to the curved surface area of a cylinder.

The radius of the hemisphere is  $r$  cm

The radius of the cylinder is twice the radius of the hemisphere.

Given that

volume of hemisphere : volume of cylinder =  $1 : m$

find the value of  $m$

(4 marks)

Answer space is on the next two pages.

Turn over

15. continued.

Turn over

15. continued.

$m =$  \_\_\_\_\_

(Total for Question 15 is 4 marks)

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Turn over

16. (a) Rationalise the denominator of

$$\frac{p + \sqrt{4q}}{p - \sqrt{4q}}$$

where  $p$  is an

integer and  $q$  is a prime number.

**Simplify your answer.**

**(3 marks)**

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

**Turn over**

16. (a) continued.



**(continued on the next page)**

**Turn over**

16. continued.

(b) Given that

$$\left(\sqrt{\frac{y}{x}}\right)^{-5} = \frac{x^m}{y^m}$$

where  $x \neq y$

find the value of  $m$

(1 mark)

Answer space continues on the  
next page.

Turn over

16. (b) continued.

$m =$  \_\_\_\_\_

(Total for Question 16 is 4 marks)

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17. Look at the diagram for Question 17 in the Diagram Book.

It is NOT accurately drawn.

It shows a triangle **ABC**

$$BC = 5.3 \text{ cm}$$

$$BA = 4.1 \text{ cm}$$

$$\text{Angle } ABC = 110^\circ$$

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

Calculate the value of the angle marked **X**

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

**(5 marks)**

Answer space is on the next two pages.

Turn over

17. continued.

Turn over

17. continued.

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**(Total for Question 17 is 5 marks)**

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**Turn over**

**18. Look at the diagram for Question 18(a) in the Diagram Book.**

**The graph of  $y = f(x)$  is shown on the grid.**

**(a) On the grid, sketch the graph of**

$$y = f\left(\frac{1}{2}x\right)$$

**(2 marks)**

**(continued on the next page)**

**18. continued.**

**Look at the diagram for Question 18(b)  
in the Diagram Book.**

**The graphs of  $y = f(x)$  and  
 $y = f(x + k)$  are shown on the grid.**

**(b) Write down the value of  $k$   
(1 mark)**

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**(Total for Question 18 is 3 marks)**

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**Turn over**

19.  $g$  is the function with domain  $x \geq -3$   
such that  $g(x) = x^2 + 6x$

(a) Write down the range of  $g^{-1}$   
(1 mark)

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(continued on the next page)

Turn over

19. continued.

(b) Express the inverse function

$g^{-1}$  in the form  $g^{-1} : x \mapsto \dots$

(4 marks)

Answer space continues on the  
next two pages.

Turn over

19. (b) continued.

Turn over

19. (b) continued.

$$g^{-1} : x \mapsto \underline{\hspace{10cm}}$$

(Total for Question 19 is 5 marks)

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Turn over

20. A bowl contains  $n$  pieces of fruit.  
Of these, 4 are oranges and the rest are apples.

Two pieces of fruit are going to be taken at random from the bowl.

The probability that the bowl will then contain  $(n - 6)$  apples is  $\frac{1}{3}$

Work out the value of  $n$

Show your working clearly.

(6 marks)

Answer space is on the next three pages.

Turn over

20. continued.

Turn over

20. continued.

Turn over

**20. continued.**

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**(Total for Question 20 is 6 marks)**

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**Turn over**

21.  $(2y + 23)$ ,  $(8y + 2)$  and  $(20y - 52)$  are three consecutive terms of an arithmetic sequence.

Prove that the common difference of the sequence is **12**

(4 marks)

Answer space continues on the next two pages.

21. continued.

Turn over

**21. continued.**

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

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**TOTAL FOR PAPER IS 100 MARKS**

**END OF PAPER**

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