

**Paper Reference 4MA1/2F  
Pearson Edexcel  
International GCSE**

Total Marks
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**Mathematics A  
Level 1/2  
Paper 2F  
(Calculator)  
Foundation Tier**

**Thursday 6 June 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>					

**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.

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**Answer ALL TWENTY TWO questions.**

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

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

1. (a) Write these five numbers in order.  
Start with the smallest number.  
(1 mark)

3      -8      1      -5      0

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(continued on the next page)

1. continued.

(b) Write these five numbers in order of size.

Start with the smallest number.

(1 mark)

2.5      2.85      2.082      2.28      2.805

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(continued on the next page)

1. continued.

(c) Find

(i) the value of

$$\sqrt{196}$$

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(ii) the cube root of

$$6859$$

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(2 marks)

(Total for Question 1 is 4 marks)

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

The bar chart gives information about the population, in millions, of each of five cities.

Cairo has a population of **12** million.

(a) Draw a bar on the bar chart to show this information.

(1 mark)

The populations of two cities are equal.

(b) Write down the names of these two cities.

(1 mark)

\_\_\_\_\_ and \_\_\_\_\_

(continued on the next page)

2. continued.

(c) Write down the name of the city with a population of **15** million.

(1 mark)

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(d) Work out the difference in population between Jakarta and Phoenix.

(1 mark)

\_\_\_\_\_ million

(continued on the next page)

Turn over

2. continued.

In Manila, there are **90** badminton clubs and **60** football clubs.

(e) Find the ratio of the number of badminton clubs to the number of football clubs.

Give your ratio in its simplest form.

(2 marks)

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(Total for Question 2 is 6 marks)

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

**A, B and C** are points on a circle, centre **O**  
**AOC** is a straight line.

- (a) Write down the mathematical name for the line **AC**

(1 mark)

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- (b) Write down the mathematical name for the line **AB**

(1 mark)

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- (c) On the diagram, shade a sector of the circle.  
(1 mark)

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

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

It shows four shapes.

One of these four shapes has exactly one line of symmetry.

(a) Write down the letter of this shape.

(1 mark)

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(continued on the next page)

4. continued.

One of these four shapes has an order of rotational symmetry greater than 1

(b) (i) Write down the letter of this shape.

\_\_\_\_\_

(ii) Write down the order of rotational symmetry of this shape.

\_\_\_\_\_

(2 marks)

(c) Write down the name of a polygon with 8 sides.

(1 mark)

\_\_\_\_\_

(Total for Question 4 is 4 marks)

5. (a) Which one of these five fractions is equivalent to  $\frac{4}{5}$  ?

(1 mark)

$$\frac{20}{24} \quad \frac{8}{12} \quad \frac{1}{2} \quad \frac{16}{20} \quad \frac{6}{10}$$

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(continued on the next page)

5. continued.

Look at the diagram for Question 5(b) in the Diagram Book.

It shows a shape made of squares.

(b) Shade  $\frac{4}{5}$  of the shape.

(1 mark)

(c) Write  $\frac{4}{5}$  as a percentage.

(1 mark)

\_\_\_\_\_ %

(continued on the next page)

5. continued.

$\frac{4}{5}$  of a number is 48

(d) What is the number?  
(2 marks)

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(Total for Question 5 is 5 marks)

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6. Look at the diagram for Question 6 in the Diagram Book.

It shows a sequence of patterns made from sticks:  
Pattern number 1, Pattern number 2,  
Pattern number 3

(a) Pattern number 4 has been started below  
Pattern number 3

Complete Pattern number 4 on the diagram.  
(1 mark)

(continued on the next page)

6. continued.

(b) How many sticks are needed to make  
Pattern number 7?

(2 marks)



(continued on the next page)

6. continued.

(c) Work out the Pattern number of the pattern made from exactly **62** sticks.

(2 marks)



(continued on the next page)

6. continued.

Pedro says,

**“There will be a pattern in the sequence with exactly 123 sticks.”**

**(d) Is Pedro correct?**

**You must give a reason for your answer.**

**(1 mark)**

**Answer lines are on the next page.**

6. (d) continued.

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

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

The diagram shows a fair 3-sided spinner and a fair dice.

In a game, the spinner is spun once and the dice is rolled once.

The spinner can land on 1, 2 or 3

The dice can land on 1, 2, 3, 4, 5 or 6

In the game, the score is found by multiplying the number the spinner lands on by the number the dice lands on.

- (a) Complete the table in the Diagram Book to show all possible scores.

Eleven of the scores have been done for you.

(2 marks)

(continued on the next page)

7. continued.

Steven plays the game once.

(b) Work out the probability that his score is greater than 10

(2 marks)



(continued on the next page)

7. continued.

Adam plays the game and Carmen plays the game.

Adam gets a prize if his score is 5 or less.

Carmen gets a prize if her score is a multiple of 6

Carmen says the game is unfair because Adam is more likely to get a prize.

(c) Is the game unfair?

You must give a reason for your answer.

(2 marks)

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(Total for Question 7 is 6 marks)

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8. Nina buys 8 pencils and 13 identical rulers.  
Each pencil costs \$0.58  
The total cost is \$23.62

- (a) Work out the cost of each ruler.  
(3 marks)

\$ \_\_\_\_\_

(continued on the next page)

8. continued.

Bjorn has \$15 to spend on pens.

Each pen costs \$0.62

He buys as many pens as he can.

(b) Work out how much change Bjorn should get.

(3 marks)

\$ \_\_\_\_\_

(Total for Question 8 is 6 marks)

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9. Simon has  $X$  sweets.

Yuen has 2 more sweets than Simon.

Giulia has 3 times as many sweets as Yuen.

Simon, Yuen and Giulia have a total of  $T$  sweets.

(a) Write down a formula for  $T$  in terms of  $X$

Give your formula in its simplest form.

(3 marks)

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(continued on the next page)

9. continued.

(b) Make  $g$  the subject of the formula

$$r = 4g + 7$$

(2 marks)



(continued on the next page)

9. continued.

(c) Solve

$$6y - 3 = 2y + 8$$

Show clear algebraic working.

(3 marks)

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

(Total for Question 9 is 8 marks)

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Turn over

10. **ABC** is an isosceles triangle.

$$AB = 6 \text{ cm}$$

$$AC = BC = 7 \text{ cm}$$

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

Use ruler and compasses to construct triangle **ABC**

You must show all your construction lines.

The line **AB** has been drawn for you.

(2 marks)

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

Use ruler and compasses to construct the perpendicular bisector of the line **DE**

You must show all your construction lines.

(2 marks)

(Total for Question 10 is 4 marks)

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11. Calvin and Jenny are planning a holiday together.

The total cost of the flights is £1190

Calvin and Jenny share the cost of the flights so that

the money that Calvin pays : the money that Jenny  
pays = 2 : 5

(a) How much more money does Jenny pay than  
Calvin?

(3 marks)

Answer space continues on the next page.

11. (a) continued.

£ \_\_\_\_\_

(continued on the next page)

11. continued.

The cost of the villa for their holiday is **£3500**

They have to pay a deposit of **12%** of this cost.

The rest of the cost of the villa is to be paid in monthly instalments of **£220**

(b) How many monthly instalments must be paid?

(3 marks)

Answer space continues on the next page.

11. (b) continued.

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**(Total for Question 11 is 6 marks)**

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

On the grid, draw the graph of  $y = 3x - 1$  for values of  $x$  from  $-2$  to  $3$

(Total for Question 12 is 3 marks)

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

**It shows information about the heights, in cm, of 48 sunflowers in a garden centre.**

**Work out an estimate for the mean height of the sunflowers.**

\_\_\_\_\_ cm

**(Total for Question 13 is 4 marks)**

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14.  $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

$$A = \{2, 3, 5, 7\}$$

$$B = \{4, 6, 8, 10\}$$

(a) Explain why  $A \cap B = \emptyset$

(1 mark)

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(continued on the next page)

14. continued.

$$x \in \mathcal{E} \text{ and } x \notin A \cup B$$

(b) Write down the TWO possible values of  $x$   
(1 mark)

\_\_\_\_\_ , \_\_\_\_\_

(continued on the next page)

14. continued.

Set **C** is such that

$$A \cup B \cup C = \mathcal{E}$$

$$A \cap C = \{2\}$$

$$B \cap C' = \{4, 6, 10\}$$

(c) List all the members of set **C**

(2 marks)

Answer space continues on the next page.

14. (c) continued.

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(Total for Question 14 is 4 marks)

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15. A cylinder has diameter 14 cm and height 20 cm

Work out the volume of the cylinder.

Give your answer correct to 3 significant figures.

\_\_\_\_\_  $\text{cm}^3$

(Total for Question 15 is 2 marks)

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16. Josh buys and sells books for a living.

He buys 120 books for £4 each.

He sells  $\frac{1}{2}$  of the books for £5 each.

He sells 40% of the books for £7 each.

He sells the rest of the books for £8 each.

(a) Calculate Josh's percentage profit.

(5 marks)

Answer space continues on the next page.

16. (a) continued.

\_\_\_\_\_ %

(continued on the next page)

16. continued.

One book that Josh owns had a value of **£15** on the **1st May 2019**

The value of this book had increased by **20%** in the last year.

(b) Find the value of the book on the **1st May 2018**  
(3 marks)

£ \_\_\_\_\_

(Total for Question 16 is 8 marks)

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

It is NOT accurately drawn.

**ABC** and **DEF** are similar triangles.

In triangle **ABC**,

$$AB = 6 \text{ cm}$$

$$AC = 4.2 \text{ cm}$$

In triangle **DEF**,

$$DE = 15 \text{ cm}$$

$$EF = 19.5 \text{ cm}$$

$$\text{Angle } ABC = \text{Angle } DEF$$

$$\text{Angle } BAC = \text{Angle } EDF$$

(continued on the next page)

17. continued.

- (a) Work out the length of **DF**  
(2 marks)

\_\_\_\_\_ cm

(continued on the next page)

17. continued.

(b) Work out the length of **BC**  
(2 marks)

\_\_\_\_\_ cm

(Total for Question 17 is 4 marks)

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18. **30** students in a class sat a Mathematics test.  
The mean mark in the test for the **30** students was **26.8**

**13** of the **30** students in the class are boys.  
The mean mark in the test for the boys was **25**

Find the mean mark in the test for the girls.  
Give your answer correct to **3** significant figures.  
(3 marks)

Answer space continues on the next page.

18. continued.

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

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19. Change a speed of  $X$  kilometres per hour into a speed in metres per second.  
Simplify your answer.

\_\_\_\_\_ m/s

(Total for Question 19 is 3 marks)

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20. Solve the simultaneous equations

$$x + 2y = -0.5$$

$$3x - y = 16$$

Show clear algebraic working.

(3 marks)

Answer space continues on the next page.

20. continued.

$x =$  \_\_\_\_\_

$y =$  \_\_\_\_\_

(Total for Question 20 is 3 marks)

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21. Look at the diagram for Question 21 in the Diagram Book.

It is NOT accurately drawn.

It shows the positions of three ships **A**, **B** and **C**

**B** is 234 km due north of **A**

**C** is 356 km due east of **A**

Work out the bearing of **B** from **C**

Give your answer correct to the nearest degree.

(4 marks)

Answer space continues on the next page.

21. continued.

\_\_\_\_\_ ○

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

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22. The straight line **L** has gradient **5** and passes through the point with coordinates **(0, -3)**

(a) Write down an equation for **L**  
(2 marks)

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(continued on the next page)

22. continued.

(b) Look at the diagram for Question 22(b) in the Diagram Book.

The region  $R$ , shown shaded in the diagram, is bounded by four straight lines.

Write down the inequalities that define  $R$   
(2 marks)

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(Total for Question 22 is 4 marks)

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**TOTAL FOR PAPER IS 100 MARKS**

**END OF PAPER**

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