

Mathematics A  
PAPER 2FR  
Foundation Tier  
(Calculator)

Total Marks
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Monday 3 June 2024 – Morning

Time: 2 hours

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

Surname					
Other names					
Centre Number					
Candidate Number					

## **YOU MUST HAVE**

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

## **YOU WILL BE GIVEN**

**A separate Formulae Booklet**

**A separate Diagram Booklet**

## **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 in the separate Diagram Booklet – there may be more space than you need.**

**Calculators may be used.**

**You must NOT write anything in the Formulae Booklet.**

**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.**

**You may be given a model for Question 4 (b).**

**You may be given a cut out shape for Question 18 (b).**

## **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 SIX 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 of size.

Start with the smallest number.

(1 mark)

122      5      150      71      39

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(continued on the next page)

1. continued.

(b) Write these decimals in order of size.

Start with the smallest decimal.

(1 mark)

0·7

0·074

3·77

0·37

0·13

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(continued on the next page)

**1. continued.**

- (c) Write in figures the number  
five thousand and eighty four.  
(1 mark)**

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- (d) Write down the value of the 3 in the number 1324  
(1 mark)**

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**(Total for Question 1 is 4 marks)**

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2. Look at the diagram for Question 2 in the separate Diagram Booklet.

The diagram shows a bar chart.

The bar chart gives information about the total number of countries in each of five continents.

The total number of countries in Europe is **44**

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

- (b) Write down the name of the continent with **23** countries.  
(1 mark)

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- (c) Which continent has **4** times as many countries as South America?  
(1 mark)

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**2. continued.**

- (d) Work out the sum of the total number of countries in Africa and the total number of countries in Oceania.**

**(1 mark)**

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

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- 3. Look at the diagram for Question 3 (a) in the separate Diagram Booklet.**

**The diagram shows part of a number line.**

- (a) Write down the number marked with the arrow.**  
**(1 mark)**

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- (b) On the diagram provided for Question 3 (b) in the separate Diagram Booklet, draw an arrow to show a temperature of  $240^{\circ}\text{C}$**   
**(1 mark)**

**(continued on the next page)**

**3. continued.**

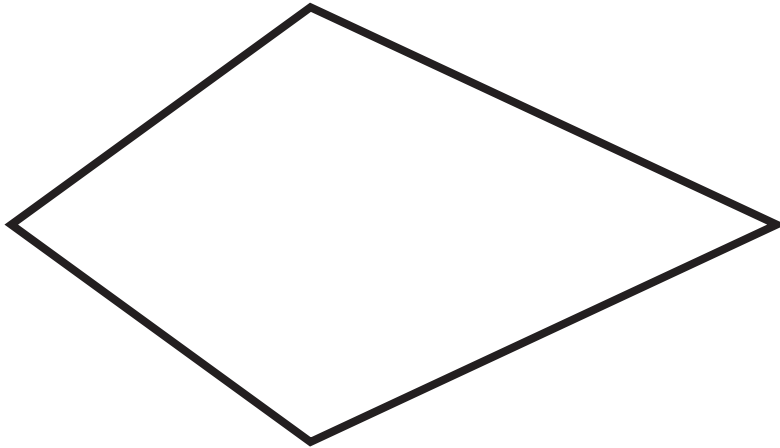
- (c) Write the number 0.786 correct to  
2 decimal places.  
(1 mark)**

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

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4. Here is a quadrilateral.



(a) What is the mathematical name for this type of quadrilateral?

(1 mark)

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(continued on the next page)

**4. continued.**

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

**The diagram shows a 3-D shape.**

**You may also be given a model.**

**(i) What is the mathematical name for this 3-D shape?**

**(1 mark)**

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**(continued on the next page)**

**4. (b) continued.**

**(ii) How many edges has this shape?**

**(1 mark)**

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

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5. Mina has 5 litres of water in a bottle and some empty cups.

She fills as many cups as possible with water from the bottle.

She fills each cup with 280 millilitres of water.

Work out how many cups Mina completely fills.

(3 marks)

Answer space continues on the next page.

**5. continued.**

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

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6. (a) Find the value of  $3 \cdot 4^2$   
(1 mark)

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- (b) Find the cube root of 373 248  
(1 mark)

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(continued on the next page)

6. continued.

- (c) Write  $7 \times 7 \times 7 \times 7 \times 7 \div 7$  as a single power of 7  
(1 mark)

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(continued on the next page)

6. continued.

(d) Write one set of brackets in each calculation to make the answer correct.

(i)  $5 + 3 \times 2 = 16$

You may rewrite the calculation and brackets in the space below if you need to.

(1 mark)

(ii)  $10 - 8 - 10 - 6 \div 2 = 0$

You may rewrite the calculation and brackets in the space below if you need to.

(1 mark)

(Total for Question 6 is 5 marks)

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Turn over

7. Here are the first five terms of a number sequence.

**−3      5      13      21      29**

(a) (i) Write down the next term of the sequence.  
(1 mark)

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(ii) Explain how you worked out your answer.  
(1 mark)

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(continued on the next page)

**7. continued.**

**(b) Explain why 326 cannot be a term of the sequence.**

**(1 mark)**

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**(Total for Question 7 is 3 marks)**

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8. Barsha buys some nails and some bolts.

Each box of nails costs £2·60

Each pack of bolts costs £3·94

Barsha buys 5 boxes of nails and 4 packs of bolts.

He pays with a £50 note.

Work out how much change he should get.

£ \_\_\_\_\_

(Total for Question 8 is 3 marks)

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9. (a) Simplify  $c \times c \times c$   
(1 mark)

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- (b) Simplify  $12d \times 3e$   
(1 mark)

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- (c) Solve  $\frac{k}{4} = 7$   
(1 mark)

$k =$  \_\_\_\_\_

9. continued.

(d) Solve  $2g - 3 = 6$

(2 marks)

$g =$  \_\_\_\_\_

(e) Expand  $x(x - 4)$

(1 mark)

\_\_\_\_\_

(continued on the next page)

Turn over



9. continued.

(f)  $P = 4y^2 + w$

Work out the value of  $P$  when  $y = -3$  and  $w = 2$   
(2 marks)

$P =$  \_\_\_\_\_

(Total for Question 9 is 8 marks)

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**10 Look at the diagram for Question 10 in the separate Diagram Booklet.**

**On the diagram, use a ruler and compasses only to construct a square with sides of length 8 cm**

**You must show all your construction lines.**

**Two sides of the square have been drawn for you.**

**(Total for Question 10 is 2 marks)**

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**11 A café sells 4 different types of cake.**

**carrot (C)**

**fruit (F)**

**lemon (L)**

**madeira (M)**

**Nala is going to choose 2 DIFFERENT types of cake.**

**(a) Write down all the possible combinations she  
can choose.**

**(2 marks)**

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**(continued on the next page)**

**11. continued.**

**(b) Look at the two-way table for Question 11 (b) in the separate Diagram Booklet.**

**The two-way table gives some information about the flavours of ice creams sold by the café on Saturday and on Sunday.**

**Complete the two-way table.**

**(2 marks)**

**(continued on the next page)**

**11. continued.**

**(c) Nala asks 100 students whether they prefer cake or ice cream.**

**33 of the students prefer cake.**

**One of the 100 students is chosen at random.**

**Find the probability that this student DOES NOT prefer cake.**

**(1 mark)**

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

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12. The size of each exterior angle of a regular polygon is  $15^\circ$

Work out the number of sides of the regular polygon.

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(Total for Question 12 is 2 marks)

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Turn over

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

The diagram shows a grid.

On the grid, draw the graph of  $y = 5 - 2x$  for values of  $x$  from  $-2$  to  $3$

You may wish to use this table.

$x$	$y$
$-2$	
$-1$	
$0$	
$1$	
$2$	
$3$	

(Total for Question 13 is 3 marks)

14. Bilpa, Claudia and David share 1200 euros.

Bilpa gets  $\frac{1}{5}$  of the 1200 euros.

Claudia gets 42% of the 1200 euros.

David gets the rest of the 1200 euros.

Given that

the amount of money Bilpa gets : the amount of money David gets = 1 : n

work out the value of n

(4 marks)

Answer space continues on the next page.



14. continued.

$n =$  \_\_\_\_\_

(Total for Question 14 is 4 marks)

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Turn over

**15. Look at the table for Question 15 in the separate Diagram Booklet.**

**The table shows information about the number of oranges in each of 30 bags.**

**(a) Write down the mode of the number of oranges in a bag.**

**(1 mark)**

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**(continued on the next page)**

**15. continued.**

**(b) Work out the mean number of oranges in a bag.**

**(3 marks)**

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**(Total for Question 15 is 4 marks)**

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**Turn over**

**16. Footballs are made in a factory.**

**On Monday, 375 footballs per hour were made in the factory.**

**On Monday, footballs were made in the factory for 8 hours.**

**On Tuesday, 20% more footballs were made than on Monday.**

**On Tuesday, 300 footballs per hour were made in the factory.**

**Work out for how many hours the factory made footballs on Tuesday.**

**(4 marks)**

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

16. continued.

\_\_\_\_\_ hours

(Total for Question 16 is 4 marks)

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Turn over

17. Write **1400** as a product of powers of its prime factors.  
Show your working clearly.

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(Total for Question 17 is 3 marks)

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Turn over

**18. Look at the diagram for Question 18 in the separate Diagram Booklet.**

**The diagram shows shape **A** and shape **B** on a coordinate grid.**

- (a) Describe fully the single transformation that maps shape **A** onto shape **B****  
**(2 marks)**

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- (b) On the grid, rotate shape **A**  $180^\circ$  about  $(-1, 0)$**   
**Label your shape **C****  
**A cut out shape may be available for this question.**  
**(2 marks)**

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

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19. Here is a list of four numbers written in ascending order of size

$x$        $x$        $y$       15

where  $x$  and  $y$  are integers.

The numbers have

a median of 12.5

a range of 4

Find the value of  $x$  and the value of  $y$   
(2 marks)

Answer space continues on the next page.



19. continued.

**x** = \_\_\_\_\_

**y** = \_\_\_\_\_

(Total for Question 19 is 2 marks)

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

$A = \{\text{factors of } 6\}$

$B = \{\text{prime numbers}\}$

(a) List the members of the set

(i)  $A \cup B$

(1 mark)

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(ii)  $A'$

(1 mark)

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(continued on the next page)

20. continued.

(b) Harpreet states that  $A \cap B = \emptyset$

Harpreet is incorrect.

Explain why.

(1 mark)

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(continued on the next page)

20. continued.

(c) **C** is a set with **4** members such that

the set **A**  $\cap$  **C** has **2** members

the set **B**  $\cap$  **C** has **2** members

Set **A**  $\cap$  **C** and set **B**  $\cap$  **C** have no members  
in common.

List the **4** members of set **C**

(2 marks)

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(Total for Question 20 is 5 marks)

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Turn over

**21. Look at the diagram for Question 21 in the separate Diagram Booklet.**

**The diagram is NOT accurately drawn.**

**The diagram shows the design for a badge, which will be made using wire.**

**The design is a circle inside a square **ABCD****

**The circle touches the square at the points **E, F, G** and **H****

**The area of the square is  $81 \text{ cm}^2$**

**Calculate the total length of wire that will be needed to make the square and the circle.**

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

**(4 marks)**

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

21. continued.

\_\_\_\_\_ cm

(Total for Question 21 is 4 marks)

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22. (a) Solve  $\frac{2f}{3} = 4f - 17$

Show clear algebraic working.

(3 marks)

$f =$  \_\_\_\_\_

(continued on the next page)

22. continued.

- (b) Simplify  $(e + 12)^0$  where  $e > 0$   
(1 mark)
- 

- (c) Simplify fully  $\frac{12d^4h^6}{4dh^2}$   
(2 marks)
- 

(continued on the next page)



**22. continued.**

- (d) Factorise fully  $20x^5y + 12x^3y^4$**   
**(2 marks)**

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**(Total for Question 22 is 8 marks)**

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23.  $\frac{3^{-2} \times 3^5}{3^{10}} = 3^n$

Find the value of n

n = \_\_\_\_\_

(Total for Question 23 is 2 marks)

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**24 In a sale, all normal prices are reduced by 17%**

**The sale price of a fridge is 6225 rupees.**

**Work out the normal price of the fridge.**

\_\_\_\_\_ rupees

**(Total for Question 24 is 3 marks)**

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**Turn over**

25. (a) Write  $6.04 \times 10^5$  as an ordinary number.  
(1 mark)

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- (b) Write 0.000 07 in standard form.  
(1 mark)

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(continued on the next page)

25. continued.

(c) Work out  $\frac{7.6 \times 10^{10}}{4 \times 10^5 - 2 \times 10^4}$

Give your answer in standard form.

(2 marks)

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(Total for Question 25 is 4 marks)

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Turn over

26. Look at the diagram for Question 26 in the separate Diagram Booklet.

The diagram is NOT accurately drawn.

The diagram shows a hexagon **ABCDEF**

In the diagram:

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

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

$$DE = 23 \text{ cm}$$

$$EF = 4.7 \text{ cm}$$

$$\text{Angle } BCF = 30^\circ$$

**AB**, **FC** and **ED** are parallel.

Calculate the area of **ABCDEF**

Show your working clearly.

(5 marks)

Answer space continues on the next page.

26. continued.

\_\_\_\_\_  $\text{cm}^2$

(Total for Question 26 is 5 marks)

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**TOTAL FOR PAPER IS 100 MARKS**

**END OF PAPER**

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