# Mathematics A
## PAPER: 1F
## Foundation Tier
## (Calculator)

**Total Marks**

**Time: 2 hours**

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

| Surname | |
|---|---|
| Other names | |
| Centre Number | |
| Candidate Number | |

**V68795A**

**Pearson**

**YOU MUST HAVE**

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

**YOU WILL BE GIVEN**

Diagram Booklet
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 in case you need them.

You may be provided with a model for Question 22

## ADVICE

Read each question carefully before you start to answer it.

Check your answers if you have time at the end.

Answer **ALL TWENTY FIVE** questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1. **Look at the table for Question 1 in the Diagram Booklet.**

   **Nav found the table in the Diagram Booklet that shows the age, in years, of each of six cities.**

   (a) **Write down the name of the city with the greatest age.**

   **(1 mark)**

   _____

**1.** continued.

    (b)  Write the number

       **2534** in words.

       **(1 mark)**

_____

_____

    (c)  Write the number

       **2351** correct to the nearest ten.

       **(1 mark)**

_____

**Turn over**

1.    continued.

(d)  Work out the difference between the age of Cadiz and the age of Nanjing.

(1 mark)

_____ years

(continued on the next page)

1. continued.

A millennium is **1000** years.

(e) What is the age of Jenin in whole millenniums?

(1 mark)

_____ millenniums

(Total for Question 1 is 5 marks)

**Turn over**

**2.** **(a)** **Simplify**

$$12p + 3p - 7p$$

**(1 mark)**

_____

**(b)** **Simplify**

$$8 \times 3q$$

**(1 mark)**

_____

**(continued on the next page)**

**2.** **continued.**

(c) Solve

$$\frac{r}{3} = 9$$

**(1 mark)**

r = _____

**(Total for Question 2 is 3 marks)**

**Turn over**

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

**It shows a probability scale.**

**(continued on the next page)**

3.   continued.

In a fruit bowl, there are only

3 bananas

7 pears

Shimon is going to take at random one of the fruits from the bowl.

(a)   Write down the letter of the arrow that points to the probability that Shimon takes

(i)   a pear,

(1 mark)

_____

3. (a) continued.

Remember:

In a fruit bowl, there are only

3 bananas

7 pears

Shimon is going to take at random one of the fruits from the bowl.

Write down the letter of the arrow that points to the probability that Shimon takes

(ii) a grape.

(1 mark)

_____

Turn over

**3.** continued.

Emma has some carrots, some potatoes and some onions in a bag.

She says that the probability of taking at random a carrot from the bag is

**1·4**

Emma is not correct.

(b) Explain why.

(1 mark)

_____

_____

_____

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

4.  Look at the diagram for Question 4(a)

in the Diagram Booklet.

It shows a polygon.

(a)  Write down the mathematical

name of the polygon.

**(1 mark)**

_____

**(continued on the next page)**

**4. continued.**

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

**It shows a scale.**

**(b) On the scale, mark the number 360**

**(1 mark)**

**(continued on the next page)**

4.    continued.

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

It shows a clock face.

(c)  Write down the time shown on the clock face.

(1 mark)

_____

(continued on the next page)

**4.** continued.

(d) **Complete the sentence below by writing a suitable metric unit on the line.**

**(1 mark)**

The length of a pen is

16 _____

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

**Turn over**

5.    Below is a list of seven numbers.

3    6    7    8    11    25    27

(a)  From the numbers in the list, write down

(i)    an even number

(1 mark)

_____

(continued on the next page)

5.    (a)    continued.

Remember:

Below is a list of seven numbers

3    6    7    8    11    25    27

From the numbers in the list, write down

(ii)    a multiple of 9

(1 mark)

_____

5. (a) continued.

Remember:

Below is a list of seven numbers

**3    6    7    8    11    25    27**

From the numbers in the list, write down

(iii) a square number

(1 mark)

_____

5.   (a)   continued.

Remember:

Below is a list of seven numbers

3    6    7    8    11    25    27

From the numbers in the list, write down

(iv)  a prime number

(1 mark)

_____

5.   continued.

(b)  Use brackets to make the statement correct.

You may use more than one pair of brackets in the statement.

(1 mark)

$$2^2 + 5 \times 2 + 3^2 = 99$$

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

**Turn over**

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

**It is NOT accurately drawn.**

**It shows a straight line ABC**

**The angles x° and 48° are marked on the line.**

**(a) (i) Work out the value of x**

**(1 mark)**

x = _____

**(continued on the next page)**

**6.** **(a)** continued.

      **(ii)** **Give a reason for your answer to (i)**

      **(1 mark)**

_____

_____

**(continued on the next page)**

**6. continued.**

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

It is NOT accurately drawn.

It shows a quadrilateral **ABCF** and an equilateral triangle **CDE**, touching at point **C**

**BCE** and **DCF** are straight lines.

Angle **ABC = 105°**

Angle **AFC = 125°**

Angle **BAF = y°**

(continued on the next page)

6.    continued.

(b)  Work out the value of  y

You must show your working.

(3 marks)

Answer space continues on the

next page.

**Turn over**

**6.** **(b)** **continued.**

y = _____

**(Total for Question 6 is 5 marks)**

**Turn over**

7. Sandeep buys some flowers.

He has **5000** rupees to spend.

He buys **6** carnations at **220** rupees each.

He also buys some roses at **295** rupees each.

Sandeep should receive **140** rupees in change from his **5000** rupees.

Work out how many roses Sandeep buys.

(4 marks)

Answer space is on the next two pages.

**Turn over**

**7.** **continued.**

**7.    continued.**

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

**8.** **(a)** **Simplify**

$$12t - 8u - 5t + 6u$$

**(2 marks)**

_____

**(continued on the next page)**

8.    continued.

Given that

$X = 3y - 5z$

(b)   work out the value of $X$ when

   $y = 12$ and $z = 4$

   (2 marks)

      $X = $ _____

Turn over

**8.** **continued.**

(c) **Solve**

$$4p + 9 = 24$$

**(2 marks)**

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

**8.** **(c)** **continued.**

p = _____

**(Total for Question 8 is 6 marks)**

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

It shows the line **AB**

**ABC** is a triangle.

**AB = 8 cm, AC = 6 cm** and

**BC = 9 cm**

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

The side **AB** has been drawn for you in the Diagram Booklet.

You must show all your construction lines.

(Total for Question 9 is 2 marks)

**Turn over**

10. Anjali wants to go on a boat at the seaside.

At the seaside there are **20** boats.

Of these boats

**2** are white

**5** are blue

**7** are green

**6** are yellow

Anjali selects at random one of these boats.

(continued on the next page)

**10. continued.**

**Write down the probability that she selects**

**(i)    a green boat,**

**(1 mark)**

_____

**(continued on the next page)**

**10.** continued.

Write down the probability that she selects

(ii) a white boat or a yellow boat.

(2 marks)

_____

(Total for Question 10 is 3 marks)

11. Johan wants to make some small cakes.

He finds a recipe that says he needs **360** grams of flour to make **15** small cakes.

Johan has **0·85 kg** of flour.

Johan works out how much flour he would need to make **38** small cakes, using the information given in the recipe.

(continued on the next page)

**Turn over**

11.   continued.

    **Does Johan have enough flour,**

    **according to the recipe, to make**

    **38 small cakes?**

    **Show your working clearly.**

    **(4 marks)**

    **Answer space continues on the next**

    **two pages.**

**11. continued.**

**11.  continued.**

**(Total for Question 11 is 4 marks)**

**12.** Look at the table for Question 12 in the Diagram Booklet.

It gives information about the number of gold stars won by each of **25** students in class **7T** last week.

(a) Work out the mean number of gold stars won.

(3 marks)

Answer space continues on the next page.

**12.  (a)  continued.**

_____

**(continued on the next page)**

**12.** **continued.**

**A student in class 8R is to be chosen at random.**

**The probability that this student won at least one gold star last week is 0·39**

**(b)** **Work out the probability that this student did NOT win at least one gold star last week.**

**(1 mark)**

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

**12. (b) continued.**

_____

**(Total for Question 12 is 4 marks)**

**Turn over**

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

It shows a grid.

On the grid, draw the graph of

$y = -2x + 3$ for values of $x$ from

$-1$ to $5$

(Total for Question 13 is 3 marks)

**Turn over**

14. In **2001**, the total number of cars produced in the world was **39·8** million.

In **2006**, the total number of cars produced in the world was **10·1** million greater than the total number produced in **2001**

(continued on the next page)

**14.** **continued.**

(a) Express **10·1** million as a percentage of **39·8** million. Give your answer correct to one decimal place.

**(2 marks)**

_____ **%**

**(continued on the next page)**

**14.** continued.

In **2011**, the total number of cars produced in the world was **59·9** million.

In **2016**, the total number of cars produced in the world was **21%** greater than the total number produced in **2011**

In **2016**, the total number of cars produced in the world was **N** million.

**14.** continued.

(b) **Work out the value of** N

**Give your answer correct to the nearest whole number.**

**(3 marks)**

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

**14.  (b)  continued.**

**N = _____**

**(Total for Question 14 is 5 marks)**

**Turn over**

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

It is NOT accurately drawn.

It shows a shape **ABCDEFG** made from a square **ABDF** and three identical isosceles triangles **BCD**, **DEF** and **FGA**

The perimeter of the square **ABDF** is **48 cm**

The perimeter of each isosceles triangle is **30 cm**

(continued on the next page)

**15.** continued.

Work out the perimeter of the shape **ABCDEFG**

**(4 marks)**

Answer space continues on the next page.

**15.  continued.**

_____ **cm**

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

16. Below are the first five terms of an arithmetic sequence.

1    5    9    13    17

(a) Find an expression, in terms of $n$, for the $n$th term of this sequence.

(2 marks)

Answer space continues on the next page.

**16. (a) continued.**

_____

**(continued on the next page)**

**16.**  **continued.**

The **n**th term of another arithmetic

sequence is  **3n + 5**

(b)  Find an expression, in terms of

m, for the **(2m)**th term of this

sequence.

(1 mark)

Answer space continues on the

next page.

**16.** **(b)** **continued.**

_____

**(Total for Question 16 is 3 marks)**

**Turn over**

17. Look at the diagram and the table for Question 17 in the Diagram Booklet. The diagram shows a biased 4-sided spinner.

The table in the Diagram Booklet gives the probabilities that, when the spinner is spun once, it will land on 1 or it will land on 3

The probability that the spinner will land on 2 is equal to the probability that the spinner will land on 4

(continued on the next page)

17. continued.

Ravina is going to spin the spinner a number of times.

Ravina works out that an estimate for the number of times the spinner will land on 3 is 45

Work out an estimate for the number of times the spinner will land on 4

(4 marks)

Answer space continues on the next page.

**17.  continued.**

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

18. (a) Find the highest common factor (HCF) of **56** and **84**

Show your working clearly.

(2 marks)

Answer space continues on the next page.

**18. (a) continued.**

_____

**(continued on the next page)**

18. continued.

(b) Find the lowest common multiple (LCM) of **60** and **72**

Show your working clearly.

(2 marks)

Answer space continues on the next page.

**18.  (b)  continued.**

_____

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

**Turn over**

19.  Look at the diagram for Question 19 in the Diagram Booklet.

It is NOT accurately drawn.

It shows parts of three regular polygons, **A**, **B** and **C**, meeting at a point.

The internal angle shown for polygon **A** = $8x°$

The internal angle shown for polygon **B** = $7x°$

The internal angle shown for polygon **C** = $3x°$

(continued on the next page)

**Turn over**

**19.  continued.**

**Polygon B has  n  sides.**

**Work out the value of  n**

**(4 marks)**

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

**19.  continued.**

**19. continued.**

**n =** _____

**(Total for Question 19 is 4 marks)**

**20.** **(a)** **Expand and simplify**

**(n – 6)(n + 4)**

**(2 marks)**

_____

**(continued on the next page)**

**Turn over**

**20. continued.**

**(b) Solve**

$$2x - 3 = \frac{3x - 5}{4}$$

**Show clear algebraic working.**

**(3 marks)**

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

**20.  (b)  continued.**

**X =** _____

**(Total for Question 20 is 5 marks)**

**Turn over**

21. Look at the table for Question 21(a) in the Diagram Booklet.

Asha bought an apartment.

The table in the Diagram Booklet gives information about the value of apartments, in euros, and the annual service charge band.

In **2021**, the value of Asha's apartment was **634 400** euros.

The value of Asha's apartment had increased by **4%** from its value in **2020**

(continued on the next page)

21. continued.

(a) Has the annual service charge band changed for Asha's apartment?

Show your working clearly.

(3 marks)

**Turn over**

**21.** **continued.**

**Pam bought a boat.**

**In each year after Pam bought the boat, the value of the boat depreciated by 15%**

**(b)** **Work out the total percentage by which the value of the boat had depreciated by the end of the second year after Pam bought the boat.**

**(3 marks)**

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

**21. (b) continued.**

_____%

**(Total for Question 21 is 6 marks)**

**Turn over**

22.  Look at the diagram for Question 22 in the Diagram Booklet.

You may be provided with a model.

They are NOT accurate.

They show a cylinder.

The cylinder is placed on the ground.

The height of the cylinder is **18 cm**

The force exerted by the cylinder on the ground is **72** newtons.

The pressure on the ground due to the cylinder is **1·4** newtons/cm$^2$

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

(continued on the next page)

**Turn over**

**22.** continued.

Work out the volume of the cylinder.

Give your answer correct to

**3** significant figures.

**(4 marks)**

Answer space continues on the next

two pages.

**22. continued.**

**22.** **continued.**

_____ **cm**$^3$

**(Total for Question 22 is 4 marks)**

**Turn over**

**23.** **(a)** **Write**

**0·000 089** in standard form.

**(1 mark)**

_____

**(continued on the next page)**

**23.** continued.

(b) Write

$8 \cdot 34 \times 10^4$ as an ordinary

number.

(1 mark)

_____

**(Total for Question 23 is 2 marks)**

**Turn over**

**24.** **(a)** **Simplify**

$$8 \times (4t)^0$$

**(1 mark)**

_____

**(continued on the next page)**

**24.** continued.

Given that

$$y^6 \div y^{-5} = y^p$$

(b) find the value of **p**

**(1 mark)**

p = _____

**(continued on the next page)**

**24.** continued.

(c) **Simplify fully**

$$(2k^2m^4)^3$$

**(2 marks)**

_____

**(Total for Question 24 is 4 marks)**

**25.** Two circles, $C_1$ and $C_2$, are drawn on a centimetre grid, with a scale of **1 cm** for **1** unit on each axis.

The centre of circle $C_1$ is at the point with coordinates $(-1, 3)$ and the radius of $C_1$ is **13 cm**

The centre of circle $C_2$ is at the point with coordinates $(7, 18)$ and the radius of $C_2$ is **6 cm**

(continued on the next page)

**Turn over**

25. continued.

   (a)  Work out the distance between the centre of $C_1$ and the centre of $C_2$

      (3 marks)

      Answer space continues on the next two pages.

**25.** **(a)** **continued.**

**25. (a) continued.**

_____ **cm**

**(continued on the next page)**

## 25. continued.

(b) Explain why circle $C_1$ intersects circle $C_2$

(1 mark)

_____

_____

_____

**(Total for Question 25 is 4 marks)**

**TOTAL FOR PAPER IS 100 MARKS**

**END OF PAPER**