Total Marks

Mathematics A
Paper 1F
Foundation Tier
(Calculator)

Thursday 7 January 2021 – Morning

Time: 2 hours plus your additional time allowance.

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

Surname	
Other names	
Centre Number	
Candidate Number	

X66295A

Pearson

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.

You may be provided with a model for Question 19

You may be provided with a shape for Question 14

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.

Answer ALL TWENTY SIX 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 Book.**

   It shows the height, in metres, of each of six volcanoes.

   (a) **Which of these volcanoes has the greatest height?**

   (1 mark)

   _____

   (b) **Write down the value of the 8 in the number 4585**

   (1 mark)

   _____

(continued on the next page)

1. continued.

(c) **Write the number 6046 in words.**

(1 mark)

_____

(d) **Write the number 5137 correct to the nearest hundred.**

(1 mark)

_____

(continued on the next page)

1. continued.

    (e) Work out the difference in the height of the Acamarachi volcano and the height of the Semeru volcano.

    (1 mark)

    _____ metres

(Total for Question 1 is 5 marks)

2. **Look at the diagrams for Question 2(a)(i) and 2(a)(ii) in the Diagram Book.**

    Sandeep is designing some 3–sided spinners.

    He is going to spin each spinner once.

    (a) (i) **Write a different number on each line so that when the spinner is spun it is IMPOSSIBLE that the spinner will land on a number greater than 9**
        There are three spaces to fill.
        (1 mark)

        (ii) **Write a different number on each line so that when the spinner is spun it is CERTAIN that the spinner will land on a multiple of 10**
        There are three spaces to fill.
        (1 mark)

2.   continued.

Look at the diagram for Question 2(b) in the

Diagram Book.

It shows a probability scale.

The likelihood of an outcome is EVENS.

(b) On the probability scale, mark the probability of

this outcome.

(1 mark)

(Total for Question 2 is 3 marks)

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

   It shows a weighing scale.

   Amir is going on holiday.

   He weighs his suitcase on the weighing scales at the airport.

   The reading on the scale gives the weight of Amir's suitcase.

   An excess luggage charge has to be paid when the weight of a suitcase is greater than **25 kg**

   This charge is $7 \cdot 45$ euros for each kilogram over the **25 kg** limit.

   Work out the excess luggage charge that Amir has to pay.

   (3 marks)

   Answer space continues on the next page.

3.   continued.

_____ **euros**

(Total for Question 3 is 3 marks)

4.   (a) Write

0·57 as a fraction.

(1 mark)

_____

(b) Write

0·02 as a percentage.

(1 mark)

_____%

(continued on the next page)

4. continued.

(c) Write

$$\frac{72}{84}$$ as a fraction in its simplest form.

(1 mark)

_____

(d) Write

$$\frac{22}{5}$$ as a mixed number.

(1 mark)

_____

(continued on the next page)

4. continued.

(e) **Work out**

$\dfrac{1}{8}$ **of 624**

(1 mark)

_____

(Total for Question 4 is 5 marks)

Turn over

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

It shows a sequence of shapes made by shading squares on a square grid.

(a) **On the grid in the Diagram Book, draw Shape number 4**

(1 mark)

(b) **Complete the table below.**
There are two spaces to fill.
(1 mark)

Shape number	Number of shaded squares
1	5
2	9
3	13
4	
5	

(continued on the next page)

5.   continued.

(c) Find the number of shaded squares in

Shape number 8

(1 mark)

_____

(d) Explain why no shape in the sequence is made

by shading exactly 50 squares.

(1 mark)

_____

_____

_____

(Total for Question 5 is 4 marks)

6. **Nav makes bracelets using cord.**

Nav has a 6 metre length of cord.

Each bracelet needs 17·5 cm of cord.

Work out the greatest number of bracelets that Nav can make.

(Total for Question 6 is 3 marks)

7. (a) Simplify

$$10w + 4y + 3w - 6y$$

(2 marks)

_____

(continued on the next page)

7. continued.

    (b) Solve

       $2n + 5 = 16$

       (2 marks)

       $n = $ _____

(Total for Question 7 is 4 marks)

Turn over

8. **Look at the two–way table for Question 8 in the Diagram Book.**

    It shows some information about the 60 noodle meals eaten in a noodle bar by each of 60 people last Friday.

    (a) **Complete the two–way table.**
         There are six spaces to fill.
         (3 marks)

    One of the 60 people is selected at random.

    (b) **Write down the probability that this person ate Fried Udon noodles.**
         (1 mark)

    _____

(Total for Question 8 is 4 marks)

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

It shows quadrilateral $ABCD$ and isosceles triangle ADE, where $AE = AD$

EDC is a straight line.

Angle $BAD = 59°$

Angle $ABC = 115°$

Angle $BCD = 68°$

Angle $AED = x°$

Work out the value of x

Give a reason for each stage of your working.

(4 marks)

Answer space continues on the next page.

9. **continued.**

x = _____

(Total for Question 9 is 4 marks)

10. **In Koko's shop**

5 chocolate bars cost **$5·75**

2 chocolate bars and **3** packets of sweets cost **$7·85**

Work out the cost of one packet of sweets.

(3 marks)

Answer space continues on the next page.

10. continued.

$\$$_____

(Total for Question 10 is 3 marks)

11. **Akiko travelled from London to Tokyo by plane.**

   The plane left London at 18 40 on Friday.

   The plane arrived in Tokyo the next day, at

   06 25 London time.

   How long did the flight take?

   Give your answer in hours and minutes.

   (2 marks)

   Answer space continues on the next page.

11. continued.

_____ **hours** _____ **minutes**

(Total for Question 11 is 2 marks)

12. (a) Expand

$$x(4-x)$$

(1 mark)

_____

(continued on the next page)

12. continued.

Given that

$t = pq - r$

$p = 1 \cdot 5 \qquad q = 2 \cdot 4 \qquad r = -5 \cdot 6$

(b) work out the value of t

(2 marks)

t = _____

(continued on the next page)

12. continued.

(c) Make **m** the subject of

$$y = mx - n$$

(2 marks)

_____

(Total for Question 12 is 5 marks)

13. (a) Express **180** as a percentage of **750**

(2 marks)

_____%

(continued on the next page)

13. continued.

Zaina has booked a singer for a show.

The singer will get **94%** of the total money from the ticket sales.

The cost of each ticket for the show is **32·50** dirhams.

Zaina sells **180** tickets.

(b) Work out the amount of money the singer will get.

(3 marks)

Answer space continues on the next page.

13. (b) continued.

_____ **dirhams**

(Total for Question 13 is 5 marks)

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

   It shows shape A, shape B and shape C on a grid.

   A cut out shape may be available if you wish to use it.

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

   (2 marks)

   _____

   _____

   _____

   (b) **Describe fully the single transformation that maps shape B onto shape C**

   (3 marks)

   _____

   _____

   _____

   _____

(Total for Question 14 is 5 marks)

15. **Look at the table for Question 15 in the Diagram Book.**

    A bag contains 30 coloured counters.

    The table gives the number of counters of each colour.

    One of the counters is taken at random from the bag.

    (a) **Write down the probability that this counter is green.**

    (1 mark)

    ———————————————————

(continued on the next page)

Turn over

15. continued.

    (b) Write down the probability that this counter is NOT red.

    (2 marks)

_____

(Total for Question 15 is 3 marks)

Turn over

16. **Show that**

$$\frac{5}{6} - \frac{3}{8} = \frac{11}{24}$$

(Total for Question 16 is 2 marks)

17. Pieter owns a currency conversion shop.

Last Monday, Pieter changed a total of $20\,160$ rand into a number of different currencies.

He changed $\dfrac{3}{10}$ of the $20\,160$ rand into euros.

He changed the rest of the rands into dollars, rupees and francs in the ratios $9 : 5 : 2$

Pieter changed more rands into dollars than he changed into francs.

Work out how many more.

(4 marks)

Answer space continues on the next page.

Turn over

17. continued.

_____ **rand**

(Total for Question 17 is 4 marks)

Turn over

18. **Look at the table for Question 18 in the Diagram Book.**

    It gives information about the speeds, in kilometres per hour, of 80 motorbikes as each pass under a bridge.

    (a) **Write down the modal class.**

       (1 mark)

       _____

(continued on the next page)

18. continued.

(b) **Work out an estimate for the mean speed of the motorbikes as they pass under the bridge.**

Give your answer correct to

3 significant figures.

(4 marks)

_____ **kilometres per hour**

(Total for Question 18 is 5 marks)

19. Look at Diagram 1 and Diagram 2 for Question 19 in
     the Diagram Book.

     You may be provided with a model.

     They are NOT accurate.

     Diagram 1 and the model show a container for water
     in the shape of a prism.

     Diagram 2 shows the front view of the prism.

     The dimensions of the container are shown on the
     model and the diagrams.

     All the corners of the prism are right angles.

     The rectangular base of the prism, shown shaded in
     Diagram 1, is horizontal and has width 85 cm and
     length 125 cm

     The container is completely full of water.

     Tuah is going to use a pump to empty the water
     from the container so that the volume of water in
     the container decreases at a constant rate.

(continued on the next page)

19. continued.

The pump starts to empty water from the container at 10 30 and at 12 00 the water level in the container has dropped by 20 cm

Find the time at which all the water has been pumped out of the container.

(4 marks)

Answer space continues on the next page.

19. continued.

(Total for Question 19 is 4 marks)

20. $\mathcal{E}$ = {20, 21, 22, 23, 24, 25, 26, 27, 28, 29}

A = {odd numbers}

B = {multiples of 3}

List the members of the set

(i)   A ∩ B

(1 mark)

(continued on the next page)

20. continued.

Remember:

$\mathcal{E}$ **= {20, 21, 22, 23, 24, 25, 26, 27, 28, 29}**

A = {odd numbers}

B = {multiples of 3}

List the members of the set

(ii) A ∪ B

(1 mark)

_____

(Total for Question 20 is 2 marks)

Turn over

21. (a) Factorise fully

$$15y^4 + 20uy^3$$

(2 marks)

_____

(continued on the next page)

21. continued.

(b) Solve

$$4 - 3x = \frac{5 - 8x}{4}$$

Show clear algebraic working.

(3 marks)

x = _____

(Total for Question 21 is 5 marks)

22. (a) Write

2 840 000 000 in standard form.

(1 mark)

_____

(b) Write

$2 \cdot 5 \times 10^{-4}$ as an ordinary number.

(1 mark)

_____

(Total for Question 22 is 2 marks)

Turn over

23. Chen invests $40\,000$ yuan in a fixed–term bond for 3 years.

The fixed–term bond pays compound interest at a rate of $3\cdot5\%$ each year.

(a) Work out the value of Chen's investment at the end of 3 years.

Give your answer to the nearest yuan.

(3 marks)

Answer space continues on the next page.

23. (a) continued.

_____ **yuan**

(continued on the next page)

23. continued.

Wang invested **P** yuan.

The value of his investment decreased by $6 \cdot 5\%$ each year.

At the end of the first year, the value of Wang's investment was $30\,481$ yuan.

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

(3 marks)

Answer space continues on the next page.

23. (b) continued.

$$P = \underline{\hspace{4cm}}$$

(Total for Question 23 is 6 marks)

24. **Look at the diagram for Question 24 in the**

    Diagram Book.

    It is NOT accurately drawn.

    The diagram shows a curved path.

    The boundary of the path is formed by

    two semicircles, with the same centre O, and

    two straight lines.

    The inner semicircle has a radius of 7 metres.

    The path has a width of 2 metres.

    Work out the perimeter of the path.

    Give your answer correct to one decimal place.

    (3 marks)

    Answer space continues on the next page.

24. **continued.**

_____ **metres**

(Total for Question 24 is 3 marks)

25. (a) Simplify

$$(2x^3y^5)^4$$

(2 marks)

_____

(continued on the next page)

25. continued.

(b) (i) **Factorise**

$$y^2 + 5y - 36$$

(2 marks)

_____

(continued on the next page)

25. (b) continued.

(ii) Hence, solve

$$y^2 + 5y - 36 = 0$$

(1 mark)

_____

(Total for Question 25 is 5 marks)

Turn over

26. **Look at the diagram for Question 26 in the Diagram Book.**

   It is NOT accurately drawn.

   It shows an isosceles triangle ABC

   BA = BC

   D is the midpoint of AC

   DB = 16 cm

   Angle ADB is a right angle.

   Angle DAB = 65°

   Work out the perimeter of triangle ABC

   Give your answer correct to one decimal place.

   (4 marks)

   Answer space continues on the next page.

26. continued.

_____ **cm**

(Total for Question 26 is 4 marks)

TOTAL FOR PAPER IS 100 MARKS

END OF PAPER