

Mathematics  
PAPER 3 (Calculator)  
Foundation Tier

Total Marks
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Monday 10 June 2024 – Morning

Time: 1 hour 30 minutes

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, Formulae Booklet (enclosed).**

**Tracing paper may be used.**

**YOU WILL BE GIVEN**

**A separate Diagram Booklet**

**INSTRUCTIONS**

**Answer ALL questions.**

**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.**

**You must show all your working.**

**Diagrams are NOT accurately drawn, unless otherwise indicated.**

**Calculators may be used.**

**If your calculator does not have a  $\pi$  button, take the value of  $\pi$  to be 3.142 unless the question instructs otherwise.**

## **INFORMATION**

**The total mark for this paper is 80**

**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 cut-out shape for Question 18 (a).**

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

**You may be given a model for Question 24.**

**You may be given a model for Question 28.**

## **ADVICE**

**Read each question carefully before you start to answer it.**

**Try to answer every question.**

**Check your answers if you have time at the end.**

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**Answer ALL questions.**

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

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

- 1. Write 23% as a fraction.**

\_\_\_\_\_

**(Total for Question 1 is 1 mark)**

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- 2. Change 800 centimetres to metres.**

\_\_\_\_\_ metres

**(Total for Question 2 is 1 mark)**

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- 3. Write down the value of the 3 in the number 62 837**

\_\_\_\_\_

**(Total for Question 3 is 1 mark)**

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**Turn over**

4. Simplify  $7p + p - 5p$

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(Total for Question 4 is 1 mark)

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5. Write the following three fractions in order of size.  
Start with the smallest fraction.

$$\frac{1}{2} \quad \frac{2}{3} \quad \frac{1}{4}$$

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(Total for Question 5 is 1 mark)

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6. A map has a scale of 1 cm represents 4 km

On the map, the distance from town T to town U is 8 cm

(a) Work out the real distance, in km, from town T to town U.

(2 marks)

\_\_\_\_\_ km

(continued on the next page)

**6. continued.**

**(b) The real length of a road is 10 km**

**Work out the length of the road on the map.**

**Give the units of your answer.**

**(2 marks)**

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

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**7. Look at the diagram for Question 7 in the separate Diagram Booklet.**

**The diagram shows a chart.**

**Julie asks some students how they travel to school.**

**The chart shows her results.**

**(a) Write down which method of travel is the mode.**

**(1 mark)**

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**(b) More students walk to school than cycle to school.**

**How many more?**

**(1 mark)**

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**(Total for Question 7 is 2 marks)**

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**8. Aisha was born in 1993**

**There was an election in the year of Aisha's  
18th birthday.**

**There is an election every 5 years.**

**Will there be an election in 2030?**

**You must show how you get your answer.**

**(3 marks)**

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

**8. continued.**

**(Total for Question 8 is 3 marks)**

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**9. Lucia is going on a skiing holiday.**

**The cost of ski hire is £26 per day.**

**The cost of a lift pass is £45 per day.**

**The cost of ski lessons is £23·50 per hour.**

**Lucia will pay for  
ski hire for 5 days  
a lift pass for 4 days  
ski lessons for 8 hours.**

**Lucia has £500**

**Show that Lucia has enough money to pay for the  
total cost of ski hire, the lift pass and the ski lessons.  
(3 marks)**

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

**9. continued.**

**(Total for Question 9 is 3 marks)**

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

**The diagram shows a circle.**

- (a) On the diagram, draw a radius of the circle.**  
**(1 mark)**

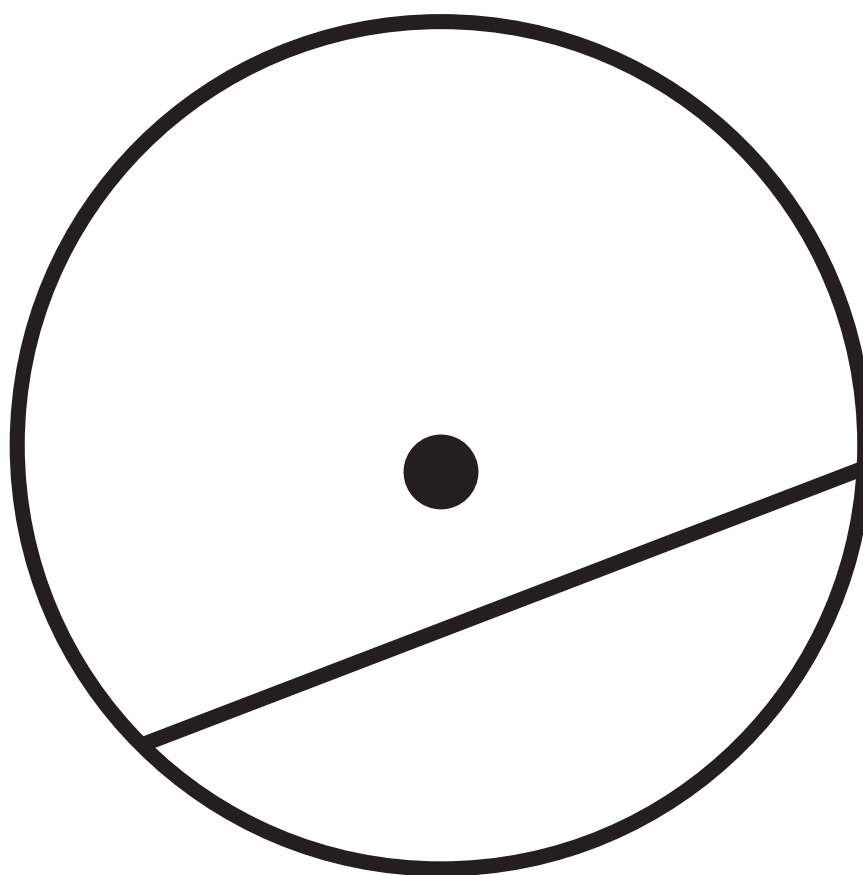
**(continued on the next page)**

**10. continued.**

**(b) Look at the diagram below. It shows another circle.**

**Write down the mathematical name for the straight line inside this circle.**

**(1 mark)**



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

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**Turn over**

11. There are 8 episodes in a TV series.  
Each episode lasts 45 minutes.

Work out the total time that the 8 episodes last.  
Give your answer in hours.

\_\_\_\_\_ hours

(Total for Question 11 is 2 marks)

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**12. Write down three prime numbers that are between  
20 and 40**

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

**(Total for Question 12 is 2 marks)**

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**13. Look at the two-way table for Question 13 in the separate Diagram Booklet.**

**James asks students in Year 10 and Year 11 to name their favourite language from French or German or Spanish.**

**The two-way table shows information about his results.**

**Complete the two-way table.**

**(Total for Question 13 is 3 marks)**

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14. The table below gives information about the drinks people ordered in a cafe.

Drink	Number of people
Coffee	30
Hot chocolate	10
Tea	50

On the diagram provided for Question 14 in the separate Diagram Booklet, draw an accurate pie chart for this information.

(Total for Question 14 is 3 marks)

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**15. Which is greater**

**15% of 88 OR 20% of 62?**

**You must show all your working.**

**(Total for Question 15 is 3 marks)**

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**Turn over**

16. (a) Simplify  $m \times m \times m \times m$   
(1 mark)
- 

(continued on the next page)

**16. continued.**

**(b) In a competition, a player gets**

**5 points for each game they win**

**2 points for each game they draw**

**0 points for each game they lose.**

**Amy wins  $x$  games and draws  $y$  games.**

**Write down an expression, in terms of  $x$  and  $y$ , for  
the total number of points Amy gets.**

**(2 marks)**

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

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17. Here are the ingredients needed to make **20** shortbread biscuits.

**Ingredients for 20 shortbread biscuits**

**120** grams of butter

**200** grams of flour

**50** grams of sugar

Heidi wants to make **30** shortbread biscuits.

How much of each ingredient will Heidi need?

(3 marks)

Answer space continues on the next page.

**17. continued.**

**butter \_\_\_\_\_ grams**

**flour \_\_\_\_\_ grams**

**sugar \_\_\_\_\_ grams**

**(Total for Question 17 is 3 marks)**

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

**The diagram shows a shape on a coordinate grid.**

**(a) On the grid, rotate the shaded shape  
 $180^\circ$  about  $(0, 0)$**

**You may be given a cut-out shape for  
this question.**

**(2 marks)**

**(continued on the next page)**



**18. continued.**

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

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

**Mike was asked to**

**‘Reflect shape **A** in the line with equation  $x = 3$ ’**

**Mike’s answer is shown on the grid as shape **B**.**

**His answer is wrong.**

**Explain why.**

**You may be given a cut-out shape for this question.**

**(1 mark)**

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

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

**The diagram shows a coordinate grid.**

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

**You may wish to complete the table below to help you.**

<b>x</b>	<b>y</b>
<b>−2</b>	
<b>−1</b>	
<b>0</b>	
<b>1</b>	
<b>2</b>	
<b>3</b>	

**(Total for Question 19 is 3 marks)**

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20. Look at the diagram for Question 20 in the separate Diagram Booklet.

The diagram is NOT accurately drawn.

The diagram shows isosceles triangles labelled **ABD** and **DBC**.

$$AD = DB = CB$$

$$\text{Angle } DCB = 81^\circ$$

$$\text{Angle } BDA = 4 \times \text{angle } CBD$$

Find

the size of angle **CBD** : the size of angle **DBA**

Give your answer in the form **1 : n**

You must show all your working.

(5 marks)

Answer space continues on the next page.

**20. continued.**

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

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**21. (a) Factorise  $6x - 15$**   
**(1 mark)**

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**(b) Factorise  $m^2 + 5m$**   
**(1 mark)**

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**(Total for Question 21 is 2 marks)**

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**22. Find the highest common factor (HCF) of 63 and 105**

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**(Total for Question 22 is 2 marks)**

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23. (a) (i) Write  $5.3 \times 10^4$  as an ordinary number.  
(1 mark)

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- (ii) Write  $7.4 \times 10^{-5}$  as an ordinary number.  
(1 mark)

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(continued on the next page)

**23. continued.**

**(b) Calculate the value of  $9.7 \times 10^6 + 2.45 \times 10^7$**

**Give your answer in standard form.**

**(2 marks)**

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**(Total for Question 23 is 4 marks)**

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**24. Look at the diagram for Question 24 in the separate Diagram Booklet.**

**It shows a solid triangular prism.**

**The diagram is NOT accurately drawn.**

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

**(continued on the next page)**

**24. continued.**

- (a) Look at the diagram for Question 24 (a) in the separate Diagram Booklet.**

**The diagram shows a square grid.**

**Each square on the grid represents a 1 cm square.**

**Rana is trying to draw the side elevation of the solid prism from the direction of the arrow.**

**Her answer is shown on the grid.**

**Explain why Rana's side elevation is not correct.**

**(1 mark)**

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**(continued on the next page)**

**Turn over**

**24. continued.**

**(b) Look at the diagram for Question 24 (b) in the separate Diagram Booklet.**

**The diagram shows shape A, shape B, shape C and shape D drawn on a square grid.**

**Each square on the grid represents a 1 cm square.**

**Which shape A, B, C or D is the plan view of the solid prism?**

**(2 marks)**

**Shape \_\_\_\_\_**

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

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**25. A company has 25 000 workers.**

**The number of workers increases at a rate of 6% per year for 3 years.**

**Calculate the total number of workers at the end of the 3 years.**

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

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**26. Habib has two identical tins.**

**He puts 600 grams of flour into one of the tins.**

**The flour fills the tin completely.**

**The density of the flour is  $0.6 \text{ g/cm}^3$**

**Habib puts 600 grams of salt into the other tin.**

**The salt does NOT fill the tin completely.**

**The volume of the space in the tin that is NOT filled with salt is  $700 \text{ cm}^3$**

**Work out the density of the salt.**

**You must show all your working.**

**(4 marks)**

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

26. continued.

\_\_\_\_\_ g/cm<sup>3</sup>

(Total for Question 26 is 4 marks)

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**27. Look at the diagram for Question 27 (a) in the separate Diagram Booklet.**

**The diagram shows an incomplete probability tree diagram.**

**Tim has two biased coins, coin **A** and coin **B**.**

**He is going to throw both coins.**

**The probability that coin **A** will land on heads is 0.6**

**The probability that coin **B** will land on heads is 0.55**

**(a) Complete the probability tree diagram.**

**(2 marks)**

**(continued on the next page)**

**27. continued.**

- (b) Tim throws coin A once and he throws coin B once.**

**Work out the probability that both coins land on heads.**

**(2 marks)**

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**(Total for Question 27 is 4 marks)**

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**28. Look at the diagram for Question 28 in the separate Diagram Booklet.**

**The diagram is NOT accurately drawn.**

**The diagram shows a paddling pool in the shape of a cylinder.**

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

**The pool has radius 100 cm**

**The pool has depth 30 cm**

**The pool is empty.**

**It is then filled with water at a rate of  $250 \text{ cm}^3$  per second.**

**Work out the number of minutes it takes to fill the pool completely.**

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

**You must show all your working.**

**(4 marks)**

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

**28. continued.**

\_\_\_\_\_ minutes

**(Total for Question 28 is 4 marks)**

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**Turn over**

29. (a) Calculate the value of  $W$  when  $t = -5$   
in the equation:

$$w = 40 - t^2$$

(2 marks)

$W =$  \_\_\_\_\_

(continued on the next page)

29. continued.

(b) Make **m** the subject of the formula  $p = \frac{m - 5}{3}$

(2 marks)

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(Total for Question 29 is 4 marks)

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**TOTAL FOR PAPER IS 80 MARKS**

**END OF PAPER**

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