

Write your name here

Surname

Other Names

# Mathematics

## 2019 Practice Paper Paper 3 (Calculator) Foundation Tier

Time: 1 hour 30 minutes

**You must have:** Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

### Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – there may be more space than you need.
- **Calculators may be used.**
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working.**



### 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.

### Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

1 Write 6461 correct to the nearest hundred

.....

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

2 Work out  $\frac{1}{7}$  of 84

.....

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

3 Work out 10% of £95

£.....

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

4 One night the temperature in Paris was  $-6^{\circ}\text{C}$ .  
The temperature in Moscow was  $4^{\circ}\text{C}$  less than the temperature in Paris.

What was the temperature at Moscow?

..... $^{\circ}\text{C}$

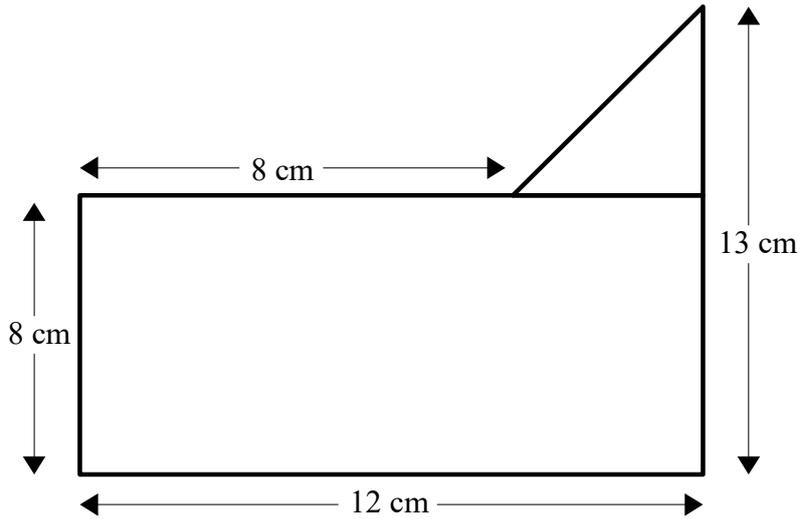
**(Total for question 4 is 1 mark)**

5 Change 3.5 metres into centimetres

.....centimetres

**(Total for question 5 is 1 mark)**

6 A shape is made from a triangle and a rectangle.



Work out the total area of the shape.

.....cm<sup>2</sup>

**(Total for question 6 is 3 marks)**

7 Poppy wants to buy as many chocolate bars as she can.

She has £5 to spend on chocolate bars.

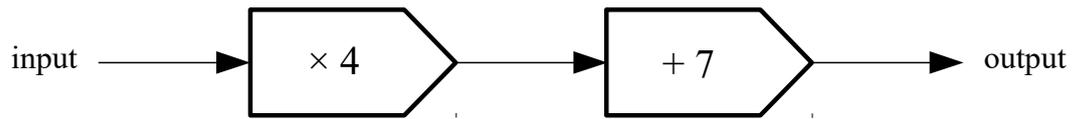
Each chocolate bar costs 42p

Work out how much change Poppy will get from £5.

.....

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

8 Here is a number machine.



(a) Find the output when the input is 5

(b) Find the output when the input is  $-3$

.....  
(1)

(c) Find the input when the output is 71

.....  
(1)

.....  
(2)

**(Total for question 8 is 4 marks)**

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9 (a) Write the ratio  $15 : 35$  in its simplest form.

.....  
(1)

(b) There are red shapes and blue shapes in a box,  $\frac{2}{3}$  of the shapes are red.

Write the ratio of red shapes to blue shapes.

.....  
(1)

**(Total for question 9 is 2 marks)**

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**10** Which is greater  
25% of 90 or 28% of 82

You must show your working.

.....

**(Total for question 10 is 3 marks)**

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**11** Here are three cards. Each card has a number on it.



Write down all the possible three digit numbers that can be made using these three cards.

.....

.....

**(Total for question 11 is 2 marks)**

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**12** Amy, Harry and Emily all save part of their salary each month.

Amy saves  $\frac{2}{15}$  of her salary

The amount Harry saves to the amount he spends is in the ratio 1:6

Emily **spends** 86% of her salary.

(a) Show that Harry saves the largest proportion of his salary.

(b) Lily says:

“This means Harry saves the most money each month”

Give a reason to say whether Lily is or is not correct.

.....  
.....

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**(Total for question 12 is 3 marks)**

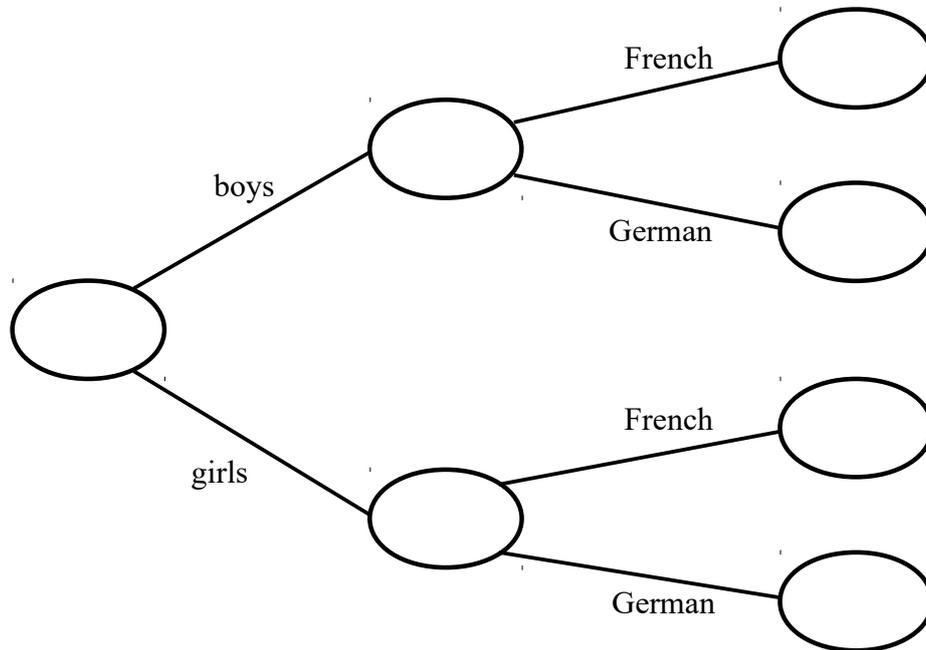
**13** 60 students study a language at a school.  
Each student either studies French or German.

36 of the students are boys.

$\frac{2}{3}$  of the boys study French

40 students study French

Use this information to complete the frequency tree.



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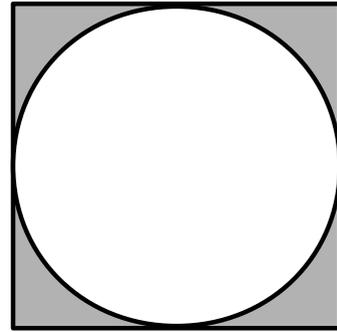
(Total for question 13 is 4 marks)

14 A circle is enclosed by a square as shown in the diagram.

Each side of the square measures 8cm.

Find the area of the shaded region.

Give your answer correct to 1 decimal place.



.....cm<sup>2</sup>

**(Total for question 14 is 3 marks)**

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15 (a) Make  $n$  the subject of  $m = n^2 + 3$

(b) Simplify  $5m^2 \times 3m^4$

.....  
(2)

(c) Expand and simplify  $(x + 3)(x - 5)$

.....  
(1)

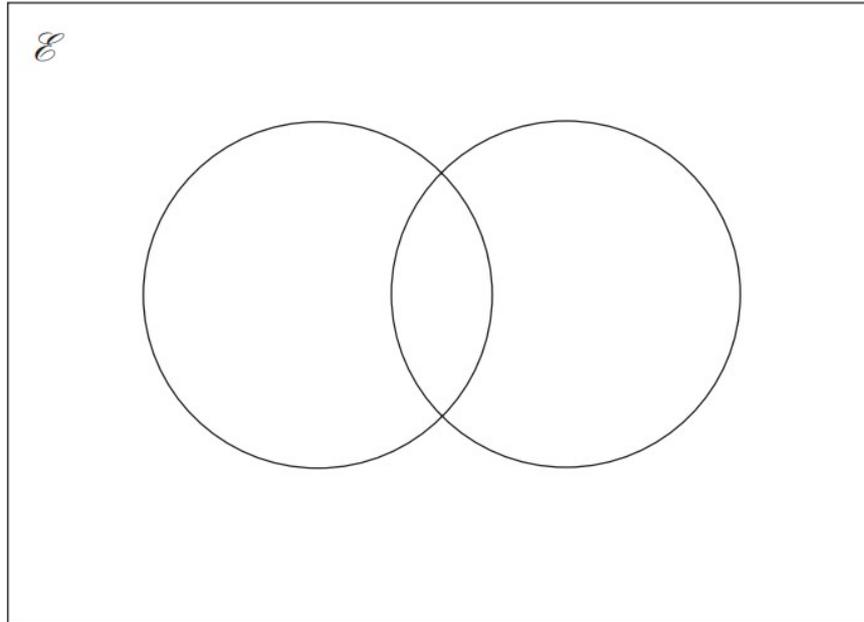
.....  
(2)

**(Total for question 15 is 5 marks)**

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- 16  $\mathcal{E} = \{\text{even numbers between 1 and 31}\}$   
 $A = \{2, 4, 8, 14, 18, 22, 28\}$   
 $B = \{8, 10, 16, 18, 22, 30\}$

(a) Complete the Venn diagram to represent this information.



(4)

A number is chosen at random from the universal set,  $\mathcal{E}$

(b) What is the probability that the number is in the set  $A \cup B$  ?

.....

(2)

**(Total for question 16 is 6 marks)**

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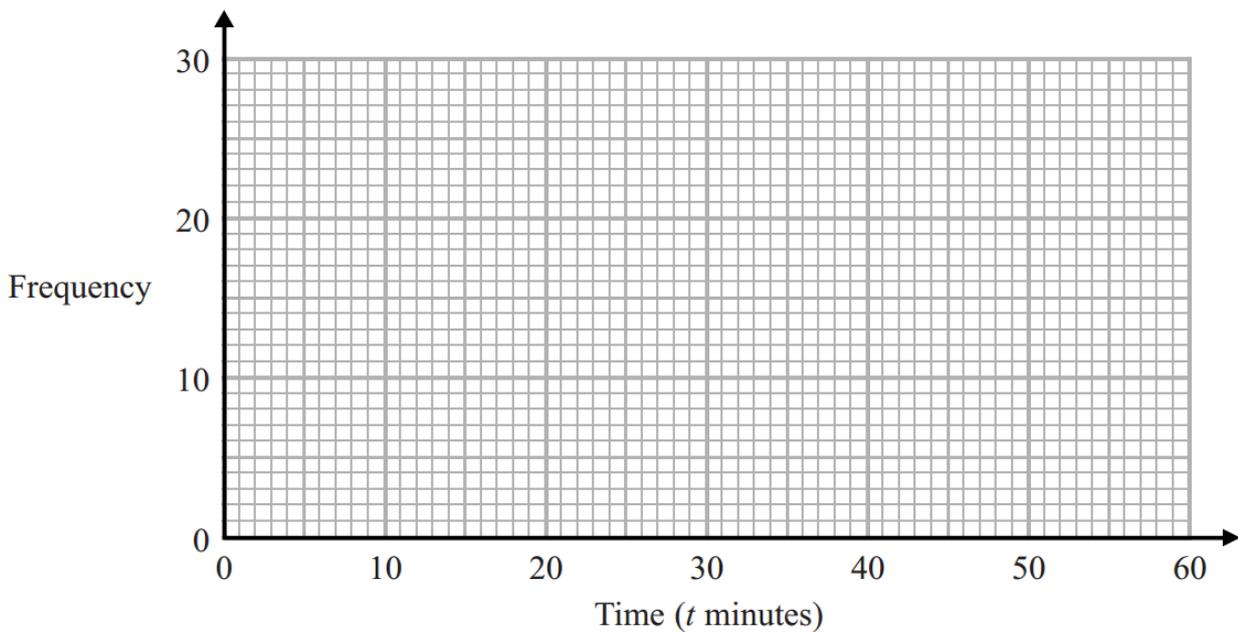
17 The frequency table shows the time taken for 100 people to travel to an event.

Time (minutes)	Frequency
$0 < t \leq 10$	14
$10 < t \leq 20$	16
$20 < t \leq 30$	23
$30 < t \leq 40$	29
$40 < t \leq 50$	12
$50 < t \leq 60$	6

(a) Find the percentage of people that travelled for more than 30 minutes to the event

.....%  
(1)

(b) Draw a frequency polygon for the information on the table.



(2)

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

18 (a) Find the reciprocal of 8

.....  
(1)

(b) Use your calculator to work out  $(2 \cos 40^\circ + 3 \sin 25^\circ)^3$   
Write down all the figures on your calculator display.

.....  
(2)

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

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19 Solve the simultaneous equations

$$\begin{aligned}2x + 5y &= 2 \\ 7x - 4y &= -1\end{aligned}$$

$x =$  .....

$y =$  .....

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

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- 20** A is the point with coordinates (3, 8)  
B is the point with coordinates (x, 13)

The gradient of AB is 2.5  
Work out the value of  $x$

.....  
**(Total for question 20 is 2 marks)**

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- 21** (a) Olivia is going to invest some money for 5 years.

She can choose from two options:

Investment A: 2.7% compound interest per annum

Investment B: 2.8% simple interest per annum

Which investment should Olivia choose  
You must show your working.

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

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**22** The exchange rate in London is  $\text{£}1 = \$1.31$

The exchange rate in New York is  $\$1 = \text{£}0.79$

Bernie wants to change some pounds into dollars.

In which of these cities would Bernie get the most dollars?  
You must show your working.

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**(Total for question 22 is 3 marks)**

**23** Each year Rose buys an annual ticket for his train journey to work.

The price of Rose's ticket increased by 2% in 2017 and 3% in 2018.

The ticket cost £2534 in 2018.

What was the price of the ticket in 2016?

£.....

**(Total for question 23 is 3 marks)**

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**24** Last year Patrick paid £2534 for his annual train ticket.  
This year he has to pay £2612 for his annual train ticket.

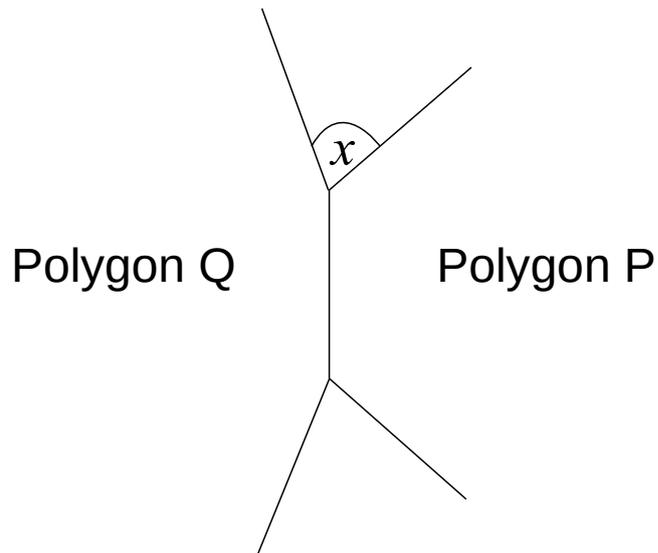
Work out the percentage increase in the cost of his train ticket.  
Give your answer correct to 3 significant figures.

.....%

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

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25 Two regular polygons P and Q have a common side as shown in the diagram.



Polygon P has  $n$  sides. Polygon Q has twice as many sides as Polygon P.

Find the size of angle  $x$  in terms of  $n$ .

.....  
(Total for question 25 is 3 marks)

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**26** Liquid **A** has a density of  $1.2 \text{ g/cm}^3$

$150 \text{ cm}^3$  of Liquid **A** is mixed with some of Liquid **B** to make Liquid **C**.

Liquid **C** has a mass of  $210 \text{ g}$  and a density of  $1.12 \text{ g/cm}^3$

Find the density of Liquid **B**.

..... $\text{g/cm}^3$

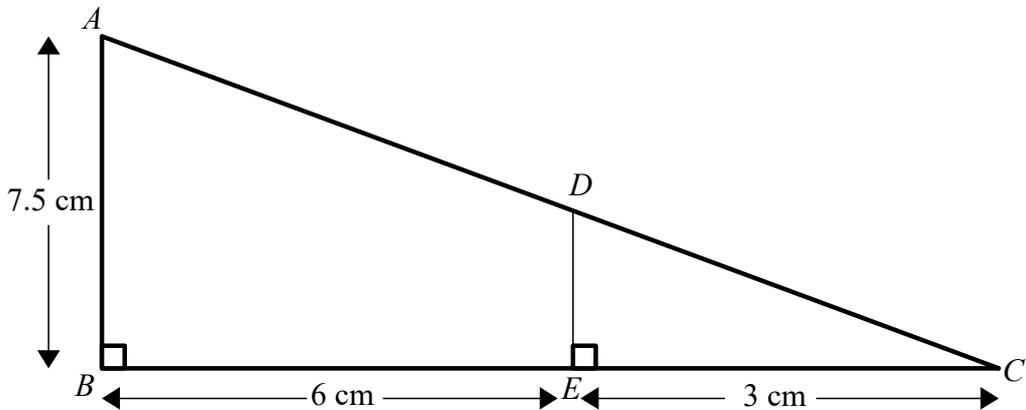
**(Total for question 26 is 3 marks)**

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27 Solve  $n^2 - 49 = 0$

.....  
**(Total for question 27 is 2 marks)**

28



(a) Find the length of  $DE$

.....cm

(2)

(b) Find the length of  $DC$

Give your answer correct to 1 decimal place.

.....cm

(3)

**(Total for question 28 is 5 marks)**