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Centre number

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# GCSE MATHEMATICS

# F

Foundation Tier      Paper 3 Calculator

Tuesday 11 June 2019

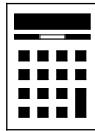
Morning

Time allowed: 1 hour 30 minutes

## Materials

For this paper you must have:

- a calculator
- mathematical instruments.



## Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

## Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.

For Examiner's Use	
Pages	Mark
2–3	
4–5	
6–7	
8–9	
10–11	
12–13	
14–15	
16–17	
18–19	
20–21	
22–23	
24–25	
26	
<b>TOTAL</b>	

## Advice

In all calculations, show clearly how you work out your answer.



J U N 1 9 8 3 0 0 3 F 0 1

Answer **all** questions in the spaces provided

- 1 Circle the value of the digit 2 in the answer to  $5200 \div 10$  [1 mark]

2

20

200

2000

- 2 Solve  $x - 8 = 5$   
Circle your answer. [1 mark]

 $x = -13$  $x = -3$  $x = 3$  $x = 13$ 

- 3 Circle the fraction that is equal to  $2\frac{1}{4}$  [1 mark]

 $\frac{7}{4}$  $\frac{9}{4}$  $\frac{21}{4}$  $\frac{25}{4}$ 

4 Circle the expression which means  $x$  divided by  $y$

[1 mark]

$$\frac{x}{y}$$

$$\frac{y}{x}$$

$$\frac{1}{xy}$$

$$\frac{1}{x+y}$$

5 Put these numbers in order from smallest to largest.

$$\frac{31}{40}$$

$$\frac{3}{4}$$

$$\frac{7}{10}$$

0.725

[2 marks]

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Smallest \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Largest \_\_\_\_\_



**6** Josh downloads album A.  
A has 11 tracks.  
Each track on A costs the same.  
The total cost of downloading A is £8.80

Josh also downloads album B.  
B has 14 tracks.

**6 (a)** Work out the total cost of downloading B.  
Assume each track costs the same as a track on A.

**[3 marks]**

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Answer £ \_\_\_\_\_



- 6 (b) In fact, compared to the cost of each track on A  
the cost of 6 tracks on B is **more** by 5p each  
the cost of 8 tracks on B is **less** by 5p each.

What does this tell you about your answer to part (a)?

Tick **one** box.

The total cost is **less** than my answer to part (a)

The total cost is **more** than my answer to part (a)

The total cost is **the same** as my answer to part (a)

Give a reason for your decision.

[2 marks]

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Turn over for the next question



7 The pictogram shows information about the houses in a street.  
Each house has 3, 4 or 5 bedrooms.

Key:  represents 2 houses

3-bedroom houses	    
4-bedroom houses	    
5-bedroom houses	 

In total, how many bedrooms do these houses have?

[3 marks]

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Answer \_\_\_\_\_



**8** Four positive whole numbers add up to 84  
One of the numbers is a multiple of 17  
The other three numbers are equal.  
What are the four numbers?

**[3 marks]**

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Answer \_\_\_\_\_

**Turn over for the next question**





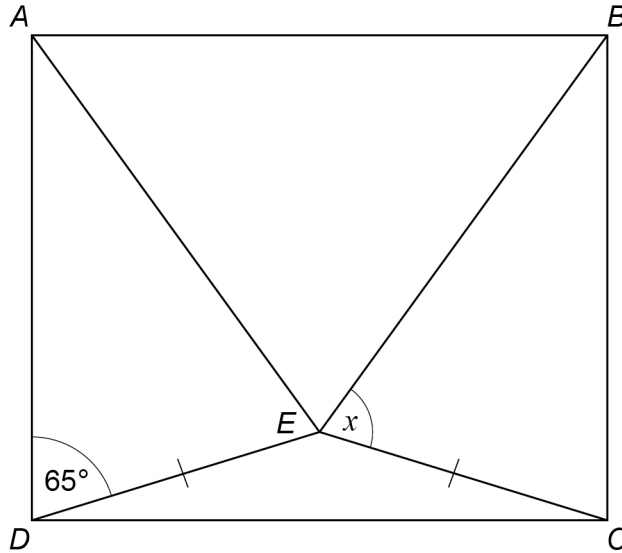


10

In rectangle  $ABCD$

triangle  $ABE$  is equilateral

triangle  $CDE$  is isosceles, with  $CE = DE$



Not drawn  
accurately

Work out the size of angle  $x$ .

[4 marks]

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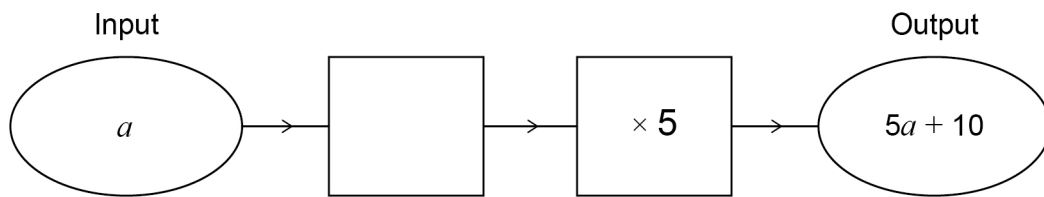


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Answer \_\_\_\_\_ degrees

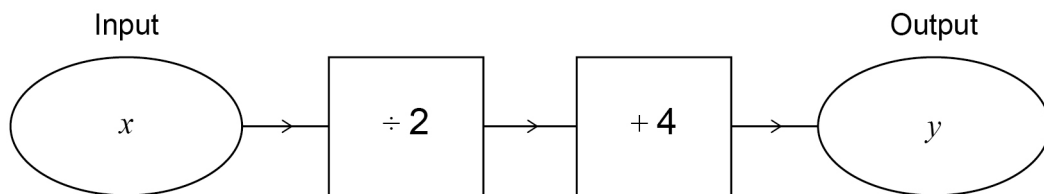


11 (a) Complete the number machine.



[1 mark]

11 (b) Write down the output  $y$  in terms of  $x$ .



[1 mark]

Answer \_\_\_\_\_



**12** The first four triangular numbers are 1, 3, 6, 10  
Circle the next triangular number.

**[1 mark]**

14

15

16

19

**13** Write down **all** the prime numbers between 40 and 50

**[2 marks]**

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Answer \_\_\_\_\_

**Turn over for the next question**



14

In this question use

$$1 \text{ cubic foot} = 6.23 \text{ gallons}$$

$$1 \text{ cubic foot} = 0.028 \text{ cubic metres}$$

Convert 3115 gallons into cubic metres.

[3 marks]

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Answer \_\_\_\_\_  $\text{m}^3$



15 Circle the correct statement.

[1 mark]

$$\frac{1}{3} \leq 30\%$$

$$\frac{1}{3} = 30\%$$

$$\frac{1}{3} < 30\%$$

$$\frac{1}{3} \neq 30\%$$

16 Which shape **must** have rotational symmetry?  
Circle your answer.

[1 mark]

isosceles triangle

trapezium

kite

parallelogram

Turn over for the next question

Turn over ►



- 17** A shop sells ice creams.  
Each ice cream has two scoops.



The possible flavours are vanilla (V), strawberry (S), chocolate (C) and mint (M).  
The two scoops can be the same flavour or different flavours.

- 17 (a)** List **all** the possible options for the two scoops.

**[2 marks]**

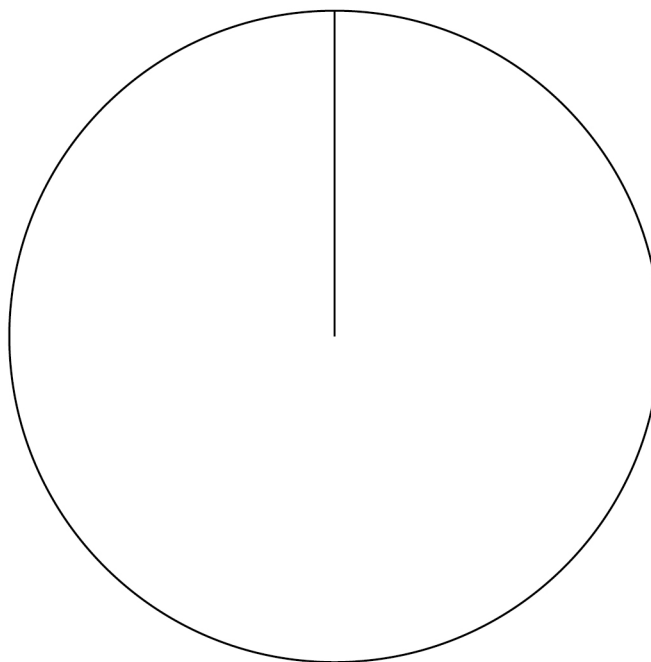


- 17 (b)** In one hour the shop sells 180 scoops of ice cream.  
The number of scoops of each flavour is shown in the table.

Flavour	Vanilla	Strawberry	Chocolate	Mint
Number of scoops	45	75	50	10

Complete the pie chart to represent the data.

**[4 marks]**



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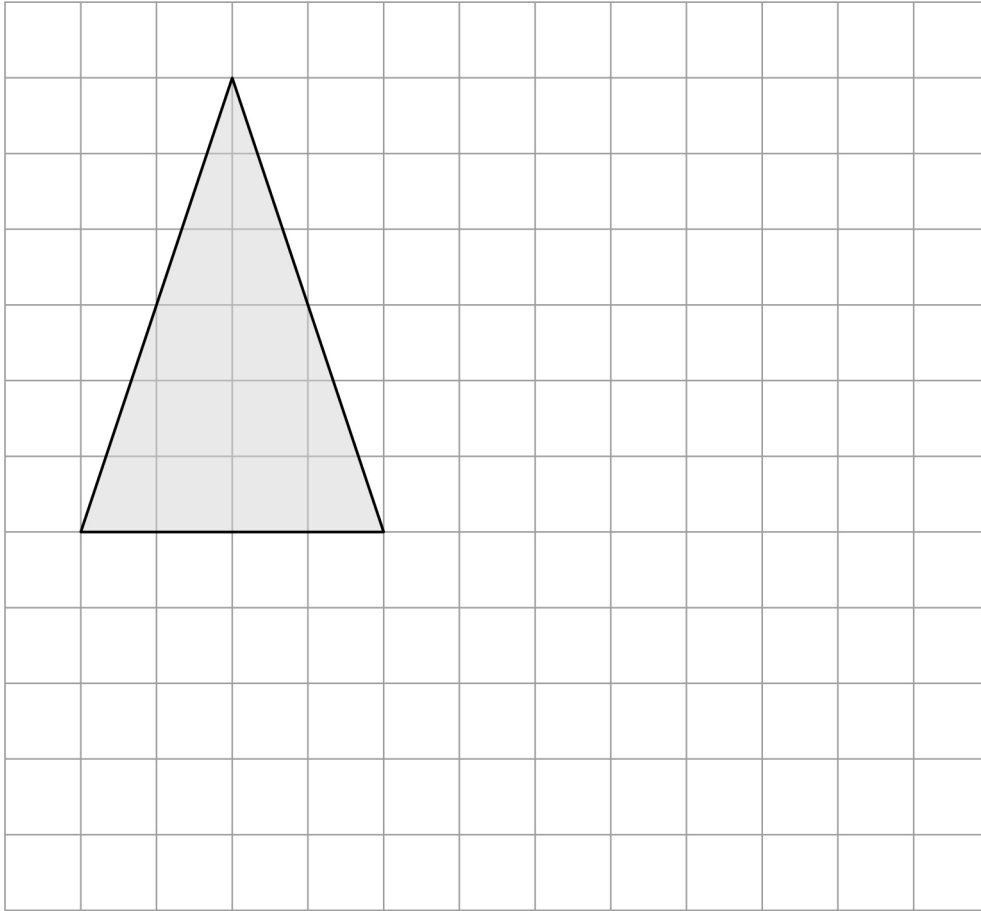
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18

On the grid, draw an enlargement of the triangle with scale factor  $\frac{1}{2}$

[2 marks]





19 (a) Simplify fully  $3a^2 + 7a + 3 - a^2 + 8a - 4$

[3 marks]

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Answer \_\_\_\_\_

19 (b) Factorise fully  $24y^2 - 20y$

[2 marks]

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Answer \_\_\_\_\_

20 Solve  $x^2 = 196$

[2 marks]

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Answer \_\_\_\_\_



21

To the nearest pound, Jon has £9

To the nearest 50p, Ellie has £6.50

Work out the maximum possible total amount of money.

[3 marks]

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Answer £ \_\_\_\_\_



22 Here is a formula.

$$T = n^2 - \frac{12}{n}$$

22 (a) Work out  $T$  when  $n = 5$

[1 mark]

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Answer \_\_\_\_\_

22 (b) Why is  $T$  **always** positive when  $n$  is negative?

[2 marks]

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24 Two solids, J and K, have the same density.

Complete the table.

Include units in your answers.

[3 marks]

	J	K
Mass	48 g	78 g
Volume	8 cm <sup>3</sup>	
Density		

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Turn over for the next question

Turn over ►



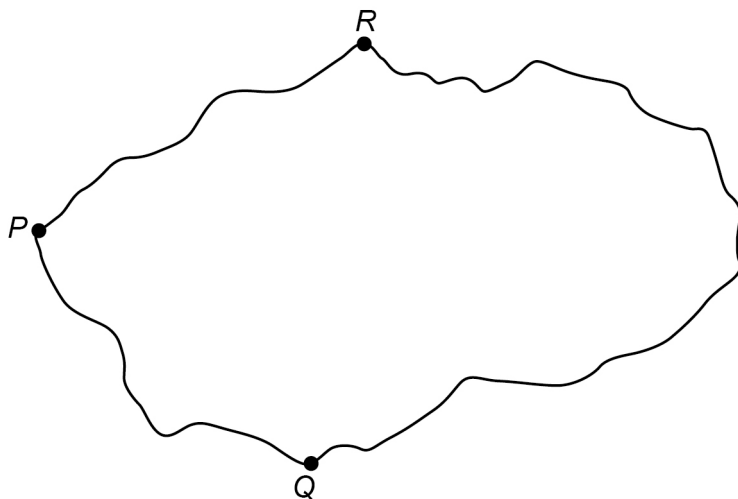
25

Towns  $P$ ,  $Q$  and  $R$  are connected by roads  $PQ$ ,  $PR$  and  $QR$ .

$PR$  is 10 km longer than  $PQ$ .

$QR$  is twice as long as  $PR$ .

The total length of the three roads is 170 km



Not drawn  
accurately

Work out the length of  $PQ$ .

[4 marks]

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Answer \_\_\_\_\_ km



**26** Mia wants to borrow £6000 and repay it, with interest, after two years.  
She sees two offers for loans.

**Offer 1**  
Compound interest  
3% per year

**Offer 2**  
Compound interest  
First year 1%  
Second year 5%

Mia says,

“I will pay back the same amount because the average of 1% and 5% is 3%”

Is she correct?

You **must** show your working.

**[3 marks]**

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**Turn over for the next question**

7

**Turn over ►**



27 Here are two sets of numbers, A and B.

**Set A**

200	160
104	100

**Set B**

270	400	483
300	$x$	

mean of Set A : mean of Set B = 3 : 8

Work out the value of  $x$ .

**[4 marks]**

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Answer \_\_\_\_\_





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outside the  
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28

A straight line

has gradient 4

and

passes through the point (5, 23)

Work out the equation of the line.

Give your answer in the form  $y = mx + c$

[3 marks]

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Answer \_\_\_\_\_

Turn over for the next question

7

Turn over ►



29 Two sides of a triangle have lengths 13 cm and 27 cm

Which of these is a **possible** length of the other side?

Circle your answer.

[1 mark]

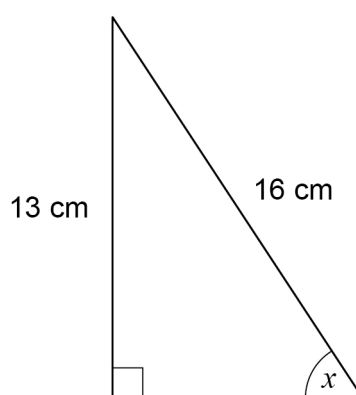
13 cm

14 cm

27 cm

40 cm

30 Here is a right-angled triangle.



Not drawn  
accurately

Use trigonometry to work out the size of angle  $x$ .

[2 marks]

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Answer \_\_\_\_\_ degrees

**END OF QUESTIONS**



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2 8



1 9 6 6 8 3 0 0 / 3 F

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