

Please write clearly in block capitals.

Centre number

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Candidate number

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Candidate signature

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# GCSE MATHEMATICS

# F

Foundation Tier      Paper 3 Calculator

Tuesday 12 June 2018

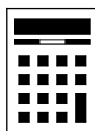
Morning

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	
26–27	
<b>TOTAL</b>	

## Advice

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



Answer **all** questions in the spaces provided

1 Circle the value of the digit 7 in 9.17

[1 mark]

$$\frac{1}{70}$$

$$\frac{1}{7}$$

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

$$\frac{7}{100}$$

2 Solve  $3x = 2$   
Circle your answer.

[1 mark]

$$x = -1$$

$$x = \frac{2}{3}$$

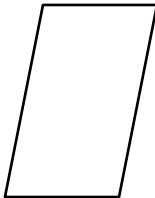
$$x = \frac{3}{2}$$

$$x = 6$$

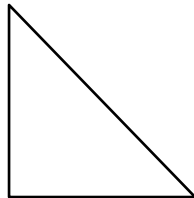
3 Which of these shapes has **no** lines of symmetry?  
Circle the correct letter.

[1 mark]

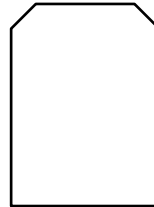
**A**



**B**



**C**



**D**



4 Circle the shortest length.

[1 mark]

1200 cm

0.13 km

110 m

140 000 mm

5 (a) Shade  $\frac{2}{5}$  of this grid.

[1 mark]


5 (b) Shade 10% of this grid.

[1 mark]




- 6** Saj wants to go to all 19 home games at a football club.  
For each game, a ticket costs £28  
A season ticket  
costs £379  
and  
gives entry to all 19 home games.

In total, how much does Saj save by buying a season ticket?

**[3 marks]**

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Answer £ \_\_\_\_\_



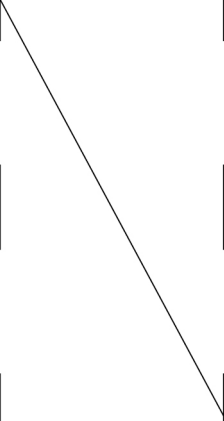
7

Link the algebra to the correct description.

One has been done for you.

**[3 marks]**

$P = 3x + 4y$	Identity
$3x + 6 \equiv 3(x + 2)$	Equation
$3x + 2 = 14$	Formula
$3x + 2$	Inequality
$3x + 2 < 14$	Expression

**Turn over for the next question****Turn over ►**

8

Jim has six banknotes.

The value of each note is £5 or £10 or £20

He **can** make £20 with three notes.

He **can** make £55 with four notes.

He **cannot** make £25 with three notes.

He **cannot** make £25 with four notes.

List the six notes.

[2 marks]

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£ \_\_\_\_\_      £ \_\_\_\_\_      £ \_\_\_\_\_

£ \_\_\_\_\_      £ \_\_\_\_\_      £ \_\_\_\_\_



**9** A music app has a shuffle play function.  
This means that songs are played in a random order **without repeat**.

**9 (a)** Ruth puts 10 songs on shuffle play.  
One of them is her favourite song.  
Write down the probability that her favourite song plays first.

**[1 mark]**

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Answer \_\_\_\_\_

**9 (b)** Ted puts songs A, B and C on shuffle play.  
List all the possible orders of songs A, B and C.  
One has been done for you.

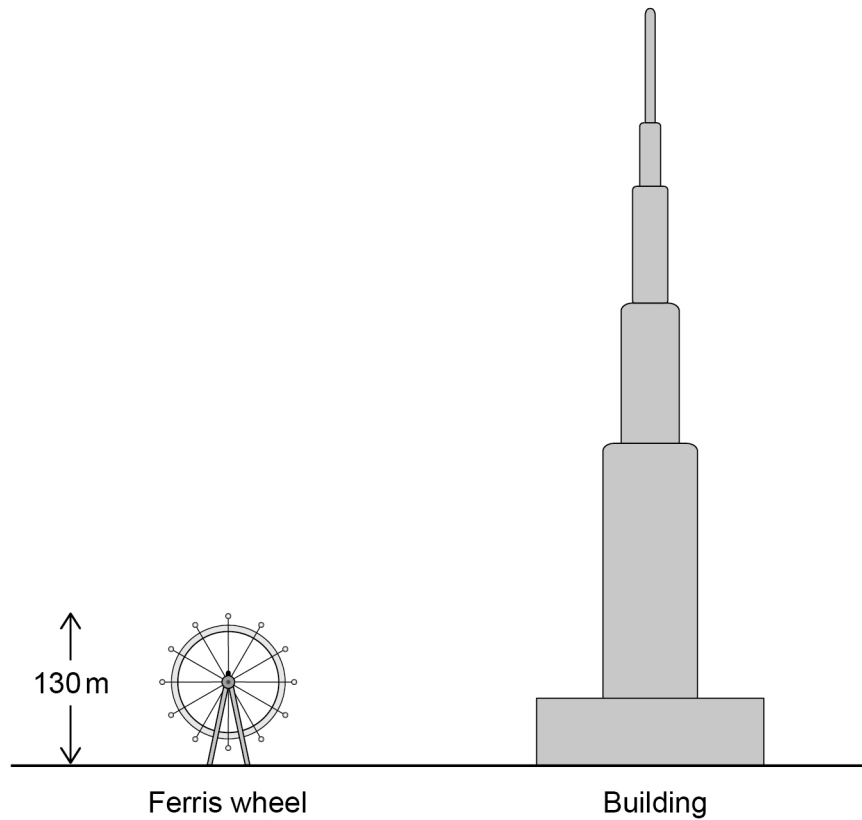
**[2 marks]**

A B C

**Turn over for the next question**



10 Here is a scale drawing.



The Ferris wheel has a height of 130 m

Work out the height of the building.

**[3 marks]**

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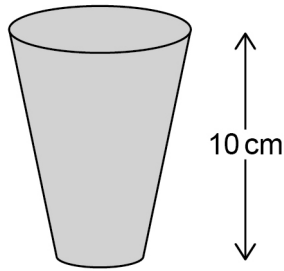
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Answer \_\_\_\_\_ m

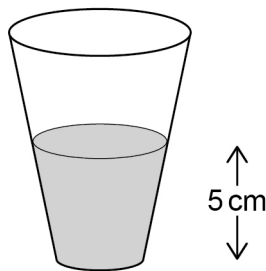




11 Jo has a full cup of coffee.



She drinks some of it.



She says,

“Half of the coffee is still in the cup, because 5 cm is half of 10 cm”

Is she correct?

Tick a box.

Yes

No

Give a reason for your answer.

[1 mark]

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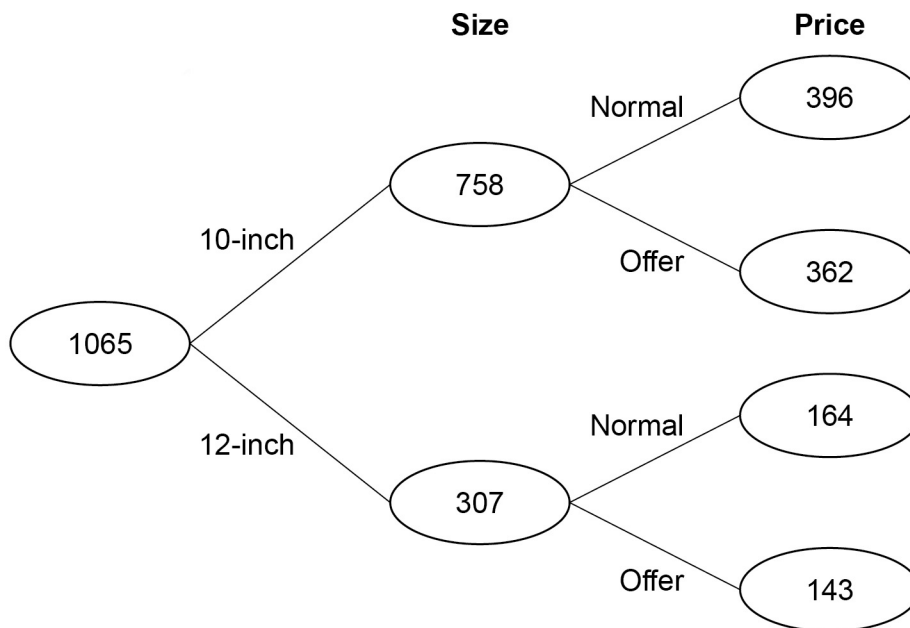


**12** A takeaway sells 10-inch pizzas and 12-inch pizzas.  
Here is some information about the numbers sold in two weeks.

**Week 1**

10-inch	512
12-inch	231
Total	743

**Week 2**



**12 (a)** In each week a proportion of the pizzas sold were 10-inch.

In which week was this proportion greater?

Show working to support your answer.

**[2 marks]**

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Answer \_\_\_\_\_



12 (b) The table shows the profit or loss the takeaway makes on each pizza.

	Normal price	Offer price
10-inch	£3.74 profit	51p loss
12-inch	£5.29 profit	4p loss

In week 1 the total profit was £1895.55

At the end of week 1 the takeaway spent £175 on adverts.

Was the **increase** in profit in week 2 more than the cost of the adverts?

You **must** show your working.

[4 marks]

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Answer \_\_\_\_\_

6
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Turn over ►



- 13** A car travels 3.5 miles in 5 minutes.  
Work out the average speed in miles per hour. **[3 marks]**

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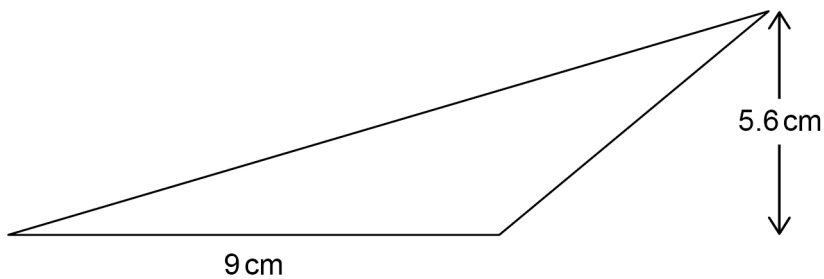
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Answer \_\_\_\_\_ mph

- 14** A triangle has base 9 cm and perpendicular height 5.6 cm Not drawn accurately



- Work out the area of the triangle. **[2 marks]**

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Answer \_\_\_\_\_ cm<sup>2</sup>



**15** Four positive whole numbers add up to 36  
One of the numbers is a multiple of 7  
The other three numbers are equal.

Work out the result when the four numbers are multiplied.

**[3 marks]**

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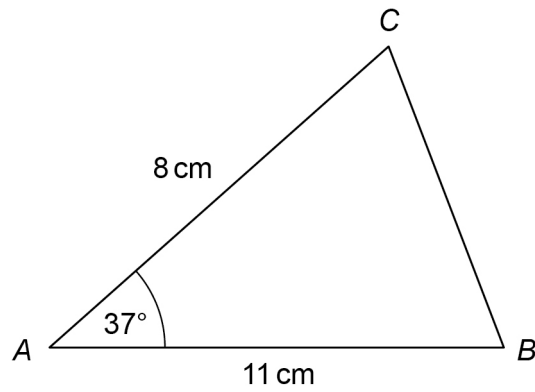
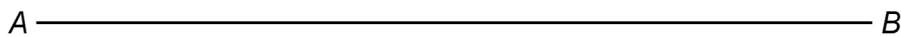
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Answer \_\_\_\_\_



16

A sketch of triangle  $ABC$  is shown.Not drawn  
accuratelyIn the space below, complete an accurate drawing of triangle  $ABC$ .**[2 marks]**

- 17 Simplify  $7x - (3x - 2x)$   
Circle your answer.

[1 mark]

$7x - 1$

$2x$

$6x$

$8x$

- 18 A competition  
took place in 1983  
takes place every six years.

Circle the year in which it will also take place.

[1 mark]

2083

2036

2049

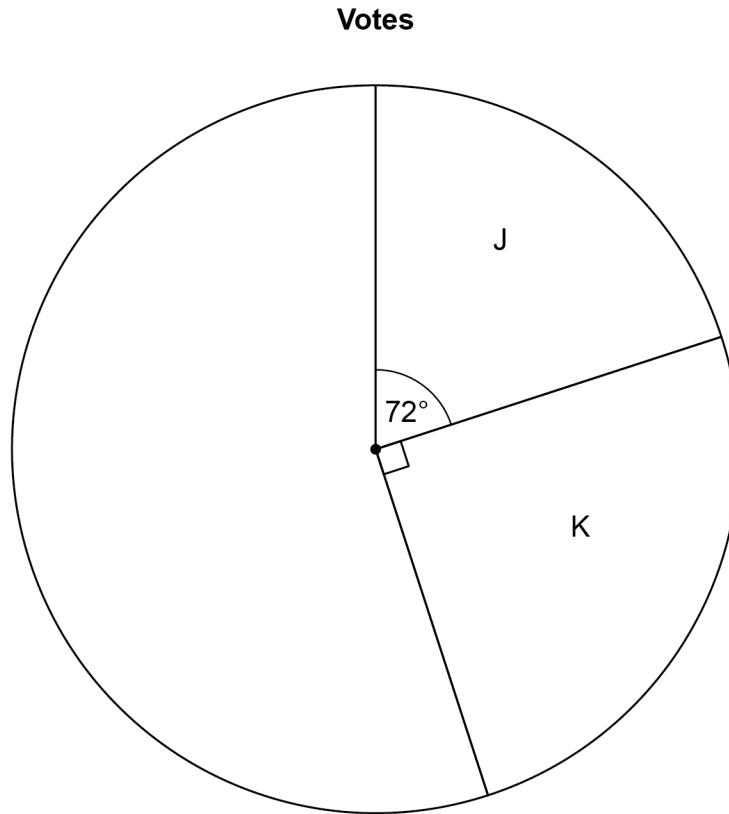
2023

Turn over for the next question

Turn over ►



- 19** In an election there were four candidates, J, K, L and M.  
Fran is drawing a pie chart to show the results.  
The sectors for J and K have been drawn.



- 19 (a)** Twice as many people voted for L as voted for M.  
Complete the pie chart.

**[3 marks]**

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19 (b) Altogether, 16 200 people voted.

How many voted for J?

[2 marks]

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Answer \_\_\_\_\_

20 The probability that A is the outcome of an experiment is 0.2

Circle the probability that A is **not** the outcome.

[1 mark]

0

0.2

0.5

0.8

21 Rearrange  $e = 2f$  to make  $f$  the subject.

Circle your answer.

[1 mark]

$$f = 2e$$

$$f = \frac{2}{e}$$

$$f = e - 2$$

$$f = \frac{e}{2}$$

Turn over for the next question

Turn over ►



22 Here is a rule for a sequence.

After the first two terms, each term is half the sum of the previous two terms

22 (a) Here is a sequence that follows this rule.

2      10      6      .....      .....      .....

Show that the 6th term is the first one that is **not** a whole number.

[3 marks]

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**22 (b)** A different sequence follows the same rule.

The 1st term is 4

The 3rd term is 9.5

4      .....      9.5

Work out the 2nd term.

**[3 marks]**

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Answer \_\_\_\_\_

**Turn over for the next question**



23

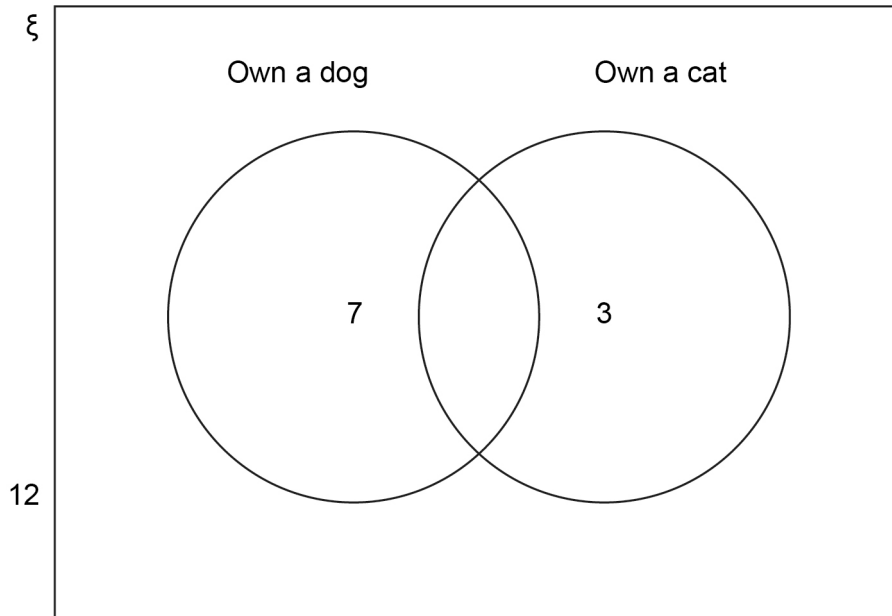
In a group of 20 people

7 own a dog

3 own a cat

12 do not own a dog or a cat.

Aidan shows this information on a Venn diagram.



Make **two** criticisms of his Venn diagram.

**[2 marks]**

Criticism 1 \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Criticism 2 \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



24

 $a$  is a common factor of 72 and 120 $b$  is a common multiple of 6 and 9Work out the highest possible value of  $\frac{a}{b}$ **[4 marks]**

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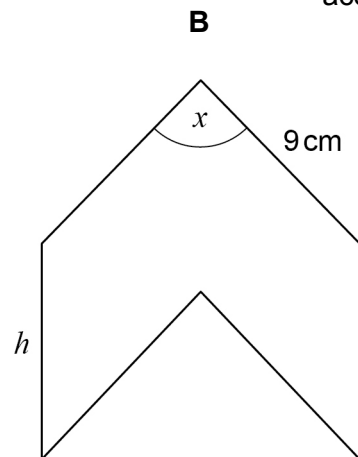
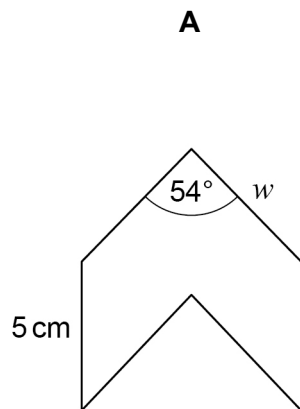
Answer \_\_\_\_\_

**Turn over for the next question**

25

A and B are similar shapes.

B is an enlargement of A with scale factor 1.5

Not drawn  
accuratelyWork out the values of  $x$ ,  $h$  and  $w$ .**[3 marks]**


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$$x = \underline{\hspace{4cm}} \text{ degrees}$$

$$h = \underline{\hspace{4cm}} \text{ cm}$$

$$w = \underline{\hspace{4cm}} \text{ cm}$$



- 26 Investment A Save £150 per month for 2 years.  
2.5% interest is added to the total amount saved.
  
- Investment B Invest £3500  
Compound interest is added at 3% per year.

After 2 years, how much **more** is investment B worth than investment A?

**[4 marks]**

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Answer £ \_\_\_\_\_

**Turn over for the next question**

7

**Turn over ►**



27 (a) Show that the lines  $y = 3x + 7$  and  $2y - 6x = 8$  are parallel.

Do **not** use a graphical method.

[3 marks]

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27 (b) Is the point  $(-5, -6)$  above, below or on the line  $y = 3x + 7$  ?

Tick **one** box.

Above

Below

On the line

You **must** show your working.

Do **not** use a graphical method.

[2 marks]

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**28** The cost of a ticket increases by 10% to £19.25

Work out the original cost.

**[3 marks]**

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Answer £ \_\_\_\_\_

**Turn over for the next question**



29 The  $n$ th term of a sequence is  $12n - 5$

Work out the numbers in the sequence that  
have two digits  
and  
are **not** prime.

[3 marks]

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Answer \_\_\_\_\_



$$30 \quad \mathbf{a} = \begin{pmatrix} 6 \\ -10 \end{pmatrix} \quad \mathbf{b} = \begin{pmatrix} -1 \\ 2 \end{pmatrix} \quad \mathbf{c} = \begin{pmatrix} -4 \\ 7 \end{pmatrix}$$

30 (a) Work out  $\mathbf{a} + \mathbf{b} + \mathbf{c}$

[2 marks]

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Answer

$$\left( \quad \right)$$

30 (b) Show that  $\mathbf{a} + 2\mathbf{c} = k\mathbf{b}$ , where  $k$  is an integer.

[2 marks]

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END OF QUESTIONS



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