AQA

Please write clearly in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname _____

Forename(s) _____

Candidate signature _____

# GCSE MATHEMATICS

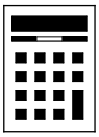
**F**

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.

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

| 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 | |
| **TOTAL** | |

Answer **all** questions in the spaces provided

*Do not write outside the box*

**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]**

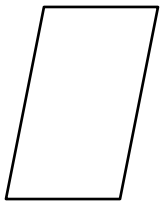
$x = -1$ $x = \frac{2}{3}$ $x = \frac{3}{2}$ $x = 6$

**3** Which of these shapes has **no** lines of symmetry?

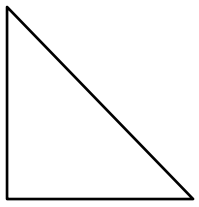
Circle the correct letter.

**[1 mark]**

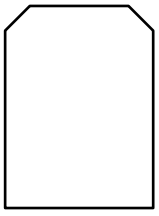
**A**



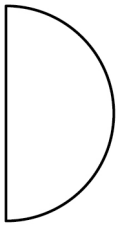
**B**



**C**



**D**



*Do not write outside the box*

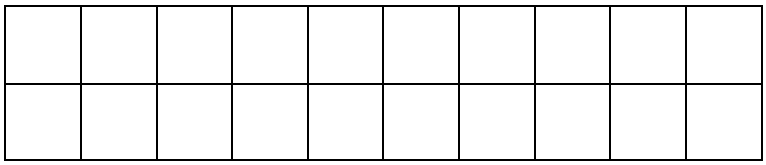
**4** Circle the shortest length.

**[1 mark]**

1200 cm  0.13 km  110 m  140 000 mm

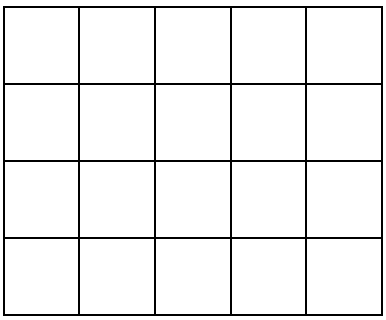
**5 (a)** Shade $\frac{2}{5}$ of this grid.

**[1 mark]**



**5 (b)** Shade 10% of this grid.

**[1 mark]**



6

**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?

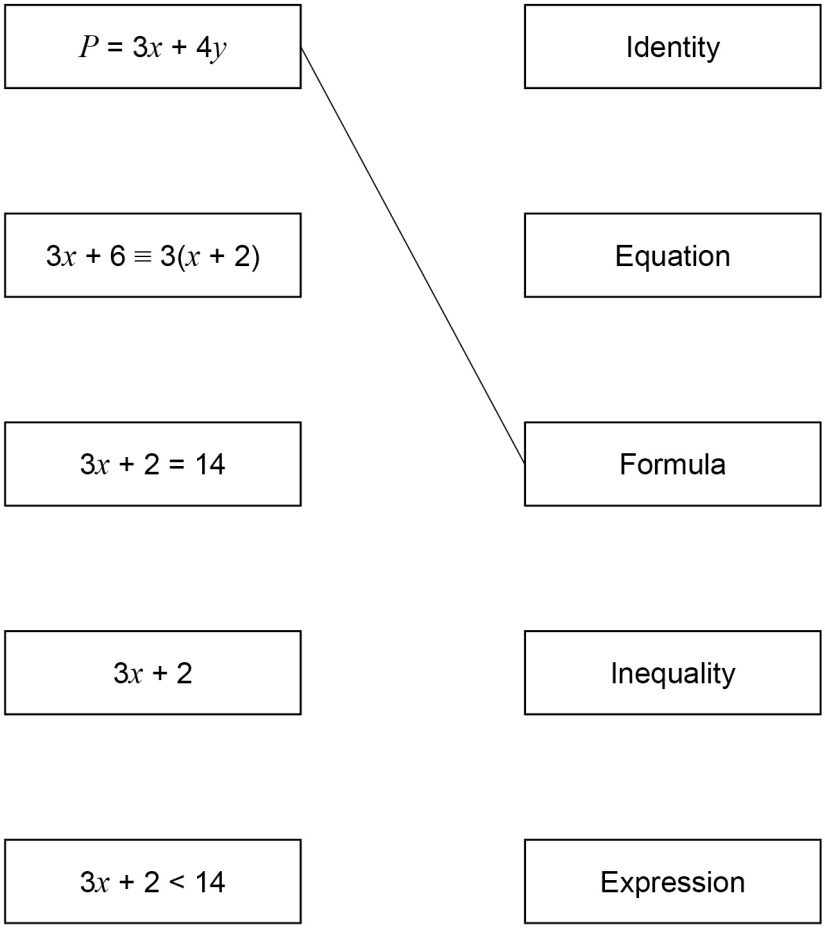
**[3 marks]**

Answer £_____

**7** Link the algebra to the correct description.

One has been done for you.

**[3 marks]**




**Turn over for the next question**



6

*Do not write outside the box*

**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]**

£_____ £_____ £_____

£_____ £_____ £_____

*Do not write outside the box*

**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]**

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.

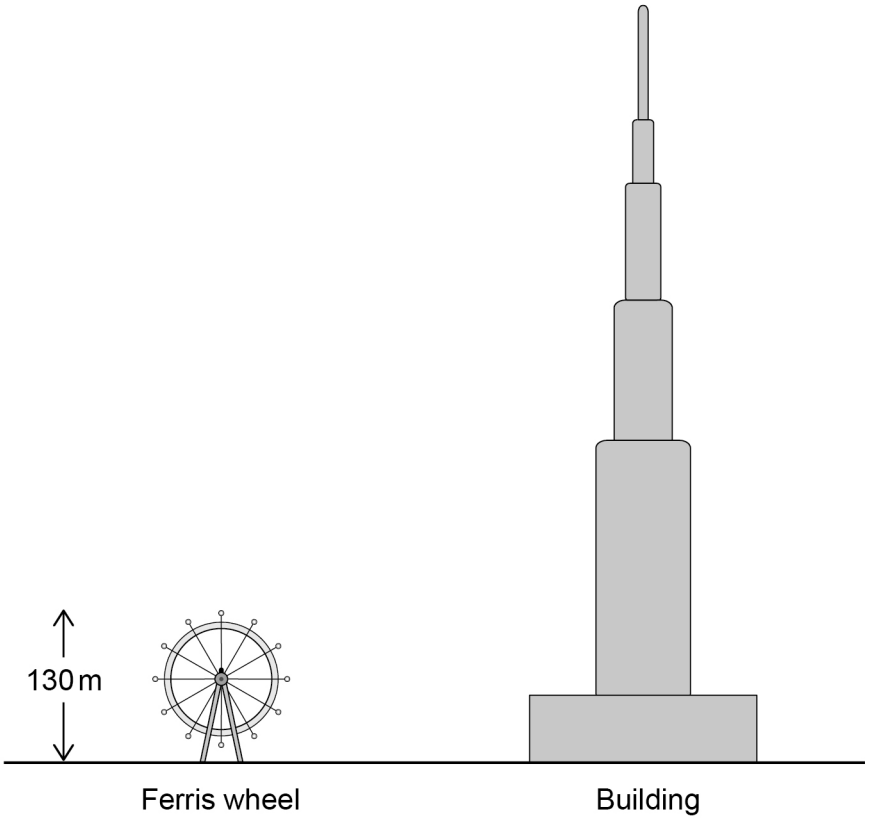
**[2 marks]**

A B C

**Turn over for the next question**

5

**10** Here is a scale drawing.




The Ferris wheel has a height of 130 m

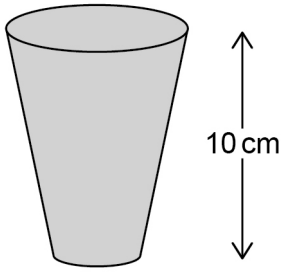
Work out the height of the building.

**[3 marks]**

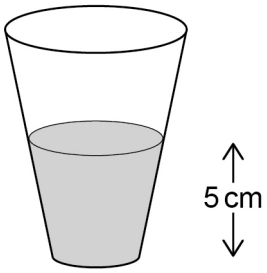
Answer _____ m

*Do not write outside the box*

**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]**

4

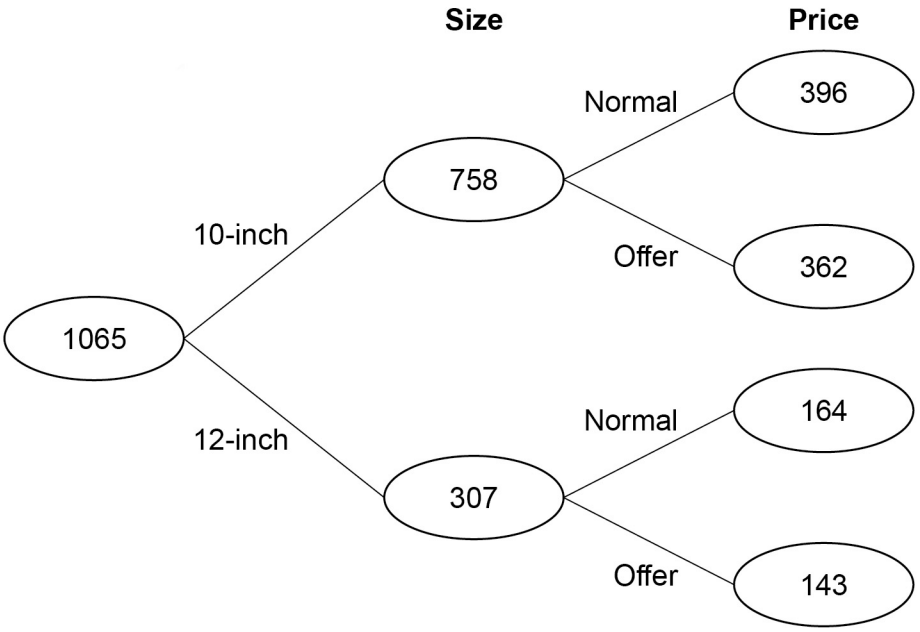
**12** A takeaway sells 10-inch pizzas and 12-inch pizzas.

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]**

Answer _____

*Do not write outside the box*

**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]**

Answer _____

6

**13** A car travels 3.5 miles in 5 minutes.

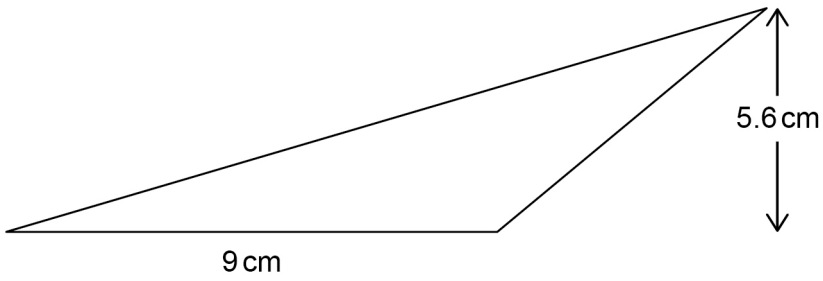
Work out the average speed in miles per hour.

**[3 marks]**

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]**

Answer _____ $cm^2$

*Do not write outside the box*

**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.

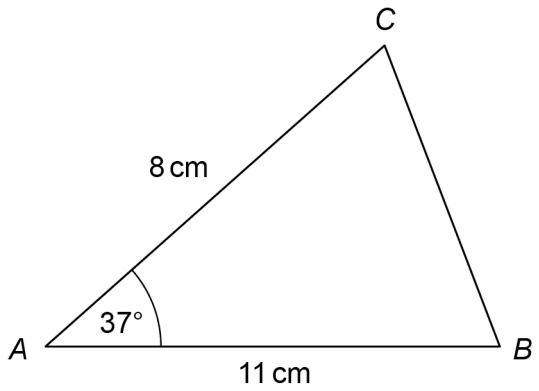
**[3 marks]**

Answer _____

8

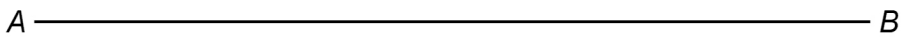
**16** A sketch of triangle *ABC* is shown.

Not drawn accurately




In the space below, complete an accurate drawing of triangle *ABC*.

**[2 marks]**



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**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**

4

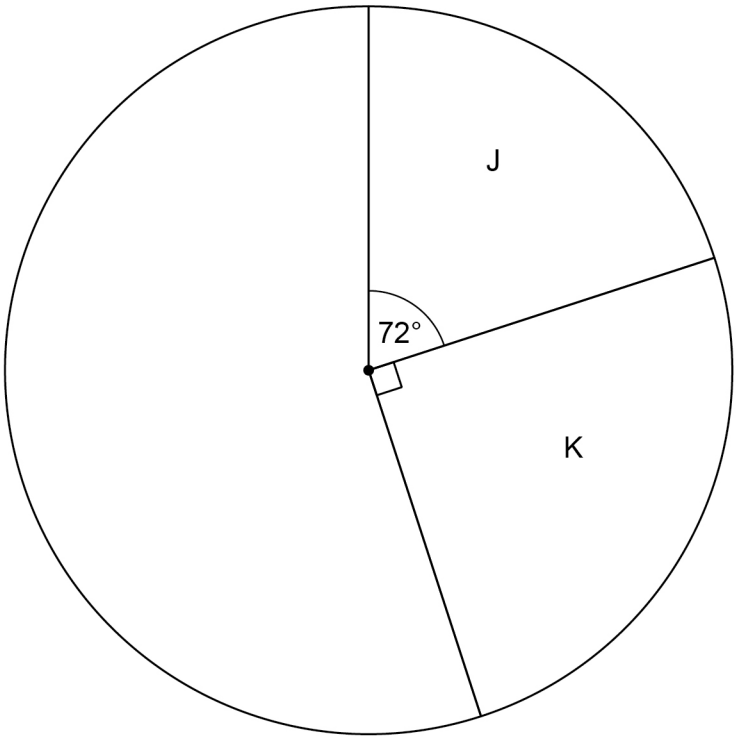
*Do not write outside the box*

**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.

**Votes**




**19 (a)** Twice as many people voted for L as voted for M.

Complete the pie chart.

**[3 marks]**

*Do not write outside the box*

**19 (b)** Altogether, 16 200 people voted.

How many voted for J?

**[2 marks]**

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**

7

**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]**

**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]**

Answer _____

**Turn over for the next question**

6

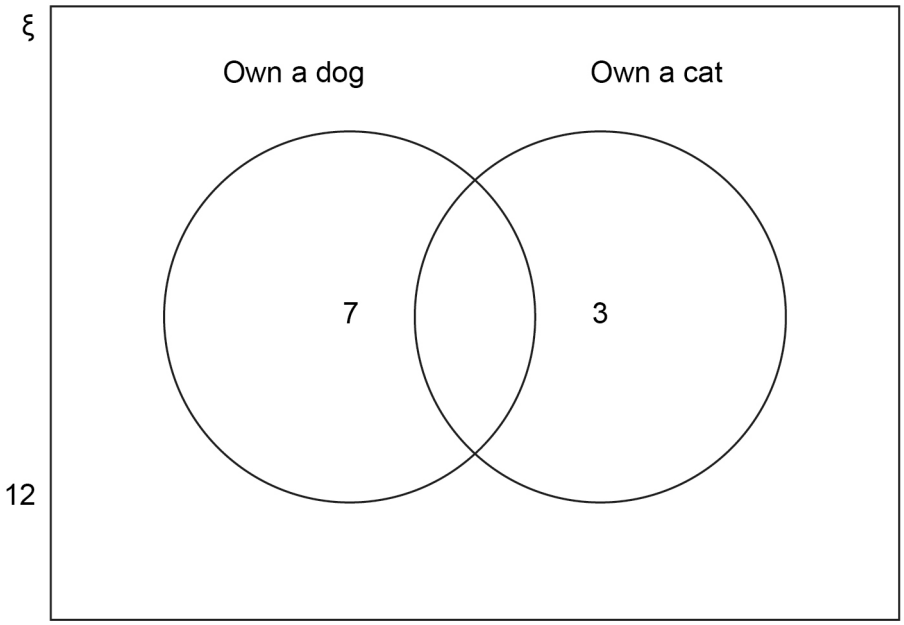
**23** In a group of 20 people

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 _____

_____

_____

*Do not write outside the box*

**24** $a$ is a common factor of 72 and 120

$b$ is a common multiple of 6 and 9

Work out the highest possible value of $\frac{a}{b}$

**[4 marks]**

Answer _____

**Turn over for the next question**

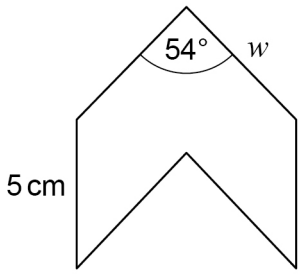
6

**25** A and B are similar shapes.

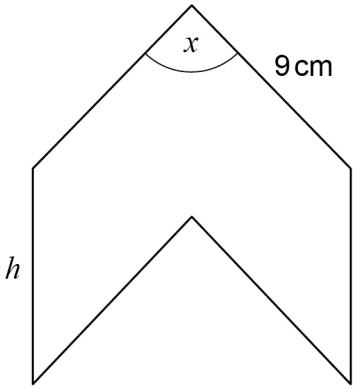
B is an enlargement of A with scale factor 1.5

Not drawn accurately

**A**




**B**




Work out the values of $x$, $h$ and $w$.

**[3 marks]**

$x$ = _____ degrees

$h$ = _____ cm

$w$ = _____ 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]**

Answer £ _____

**Turn over for the next question**

7

*Do not write outside the box*

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

Do **not** use a graphical method.

**[3 marks]**

**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]**

*Do not write outside the box*

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

Work out the original cost.

**[3 marks]**

Answer £_____

**Turn over for the next question**



8

**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]**

Answer _____

*Do not write outside the box*

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

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

**[2 marks]**

Answer $\begin{pmatrix} \quad \\ \quad \end{pmatrix}$

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

**[2 marks]**

**END OF QUESTIONS**

7

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**ANSWER IN THE SPACES PROVIDED**