Please write clearly in block capitals.

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

Surname _____

Forename(s) _____

Candidate signature _____

GCSE MATHEMATICS

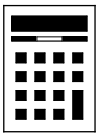
F

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	

Do not write outside the box

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]

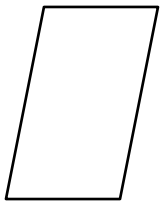
$x = -1$ $x = \frac{2}{3}$ $x = \frac{3}{2}$ $x = 6$

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

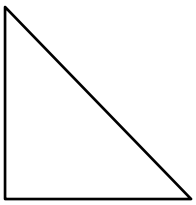
Circle the correct letter.

[1 mark]

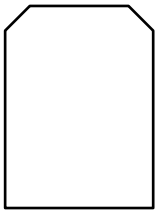
A



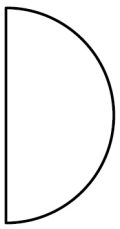
B



C



D



Do not write outside the box

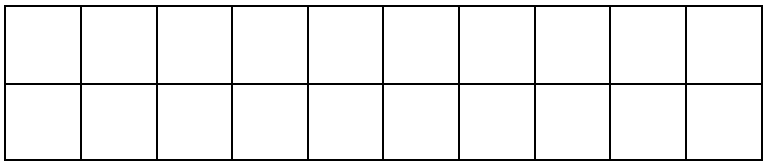
4 Circle the shortest length.

[1 mark]

1200 cm 0.13 km 110 m 140 000 mm

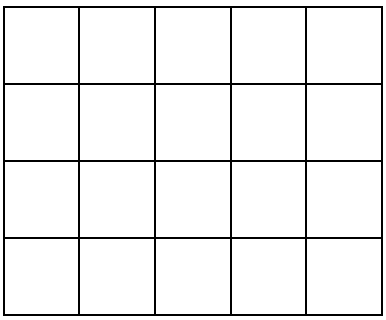
5 (a) Shade $\frac{2}{5}$ of this grid.

[1 mark]



5 (b) Shade 10% of this grid.

[1 mark]



6

Turn over ►

Do not write outside the box

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 £_____

Do not write outside the box

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

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]

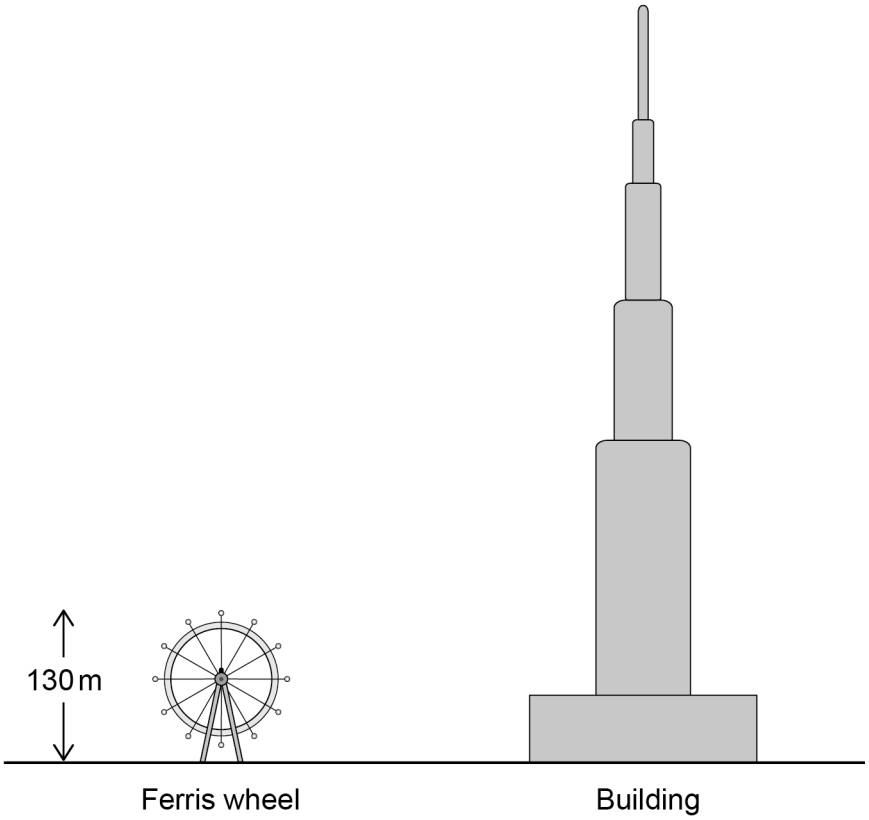
A B C

Turn over for the next question

5

Do not write outside the box

10 Here is a scale drawing.



The Ferris wheel has a height of 130 m

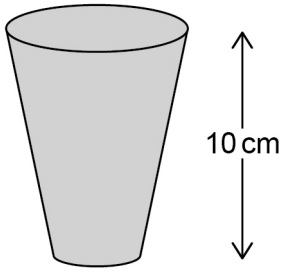
Work out the height of the building.

[3 marks]

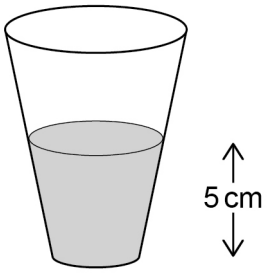
Answer _____ m

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

Turn over ►

Do not write outside the box

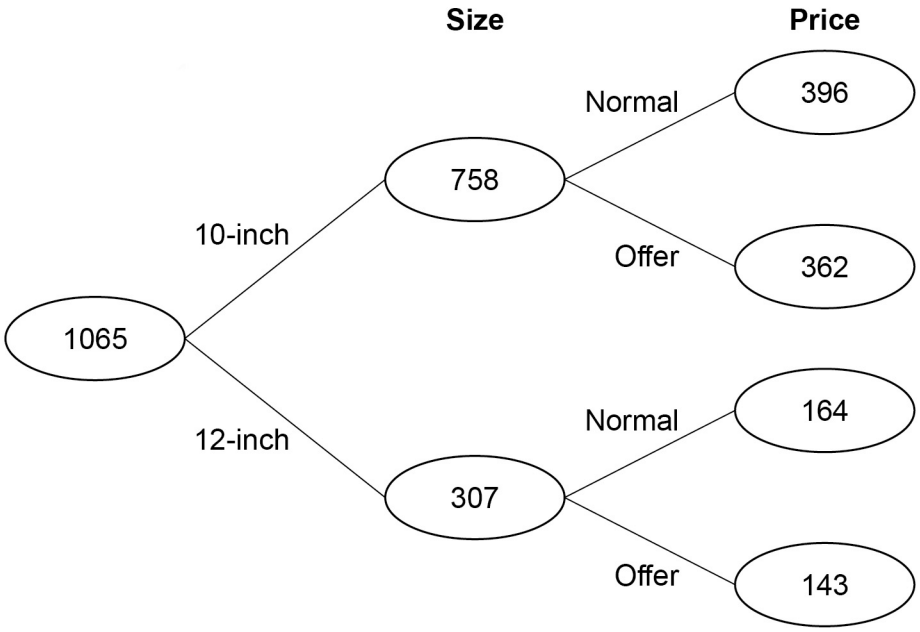
12 A takeaway sells 10-inch pizzas and 12-inch pizzas.

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

Turn over ►

Do not write outside the box

13 A car travels 3.5 miles in 5 minutes.

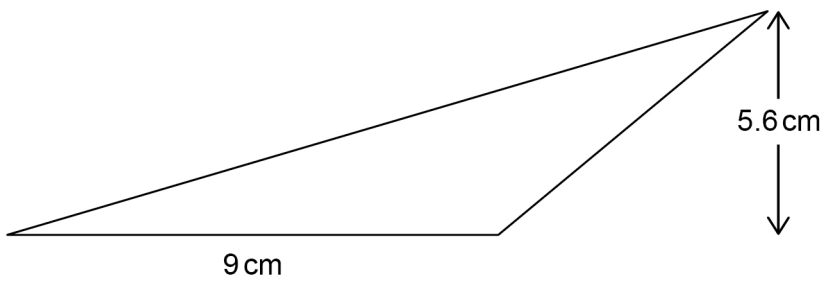
Work out the average speed in miles per hour.

[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]

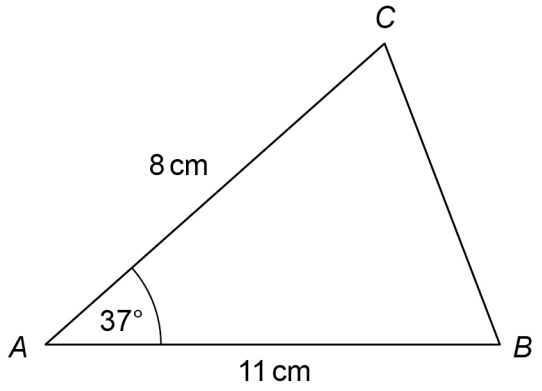
Answer _____

8

Turn over ►

Do not write outside the box

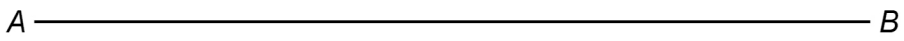
16 A sketch of triangle *ABC* is shown.



Not drawn accurately

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

[2 marks]



Do not write outside the box

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

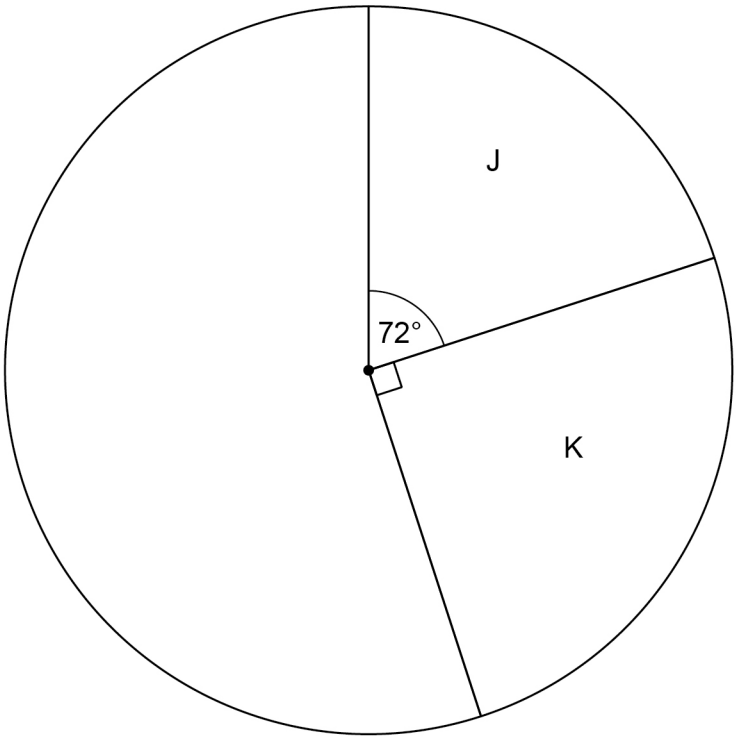
Do not write outside the box

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

Do not write outside the box

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]

Do not write outside the box

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

Do not write outside the box

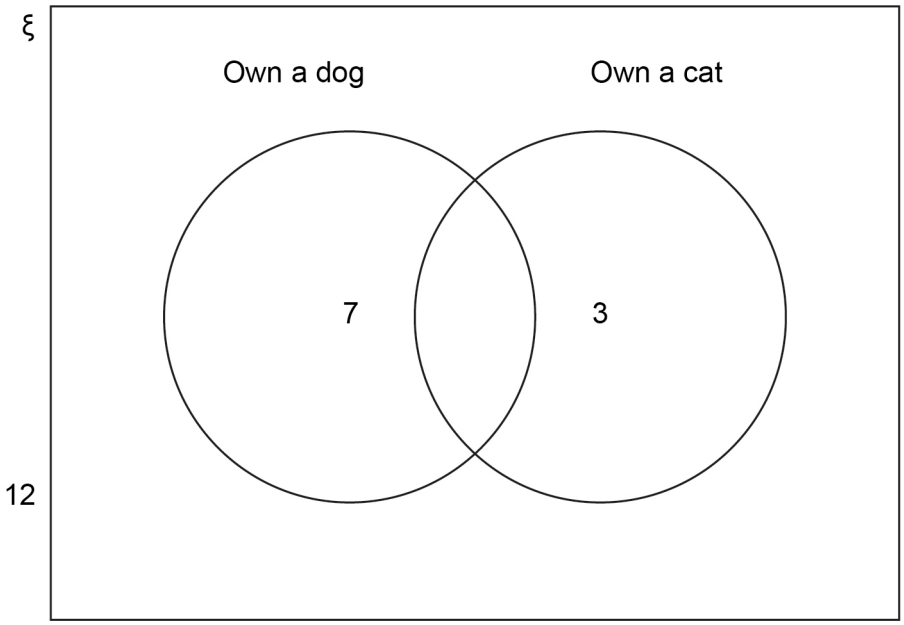
23 In a group of 20 people

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

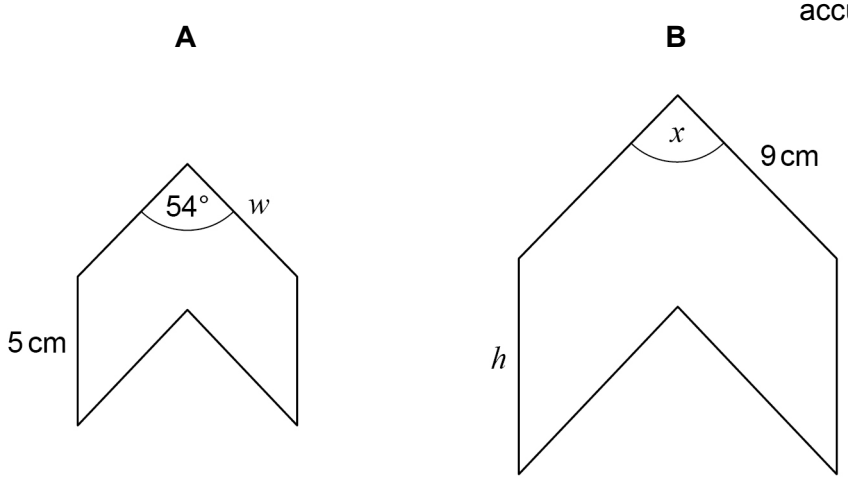
6

Do not write outside the box

25 A and B are similar shapes.

B is an enlargement of A with scale factor 1.5

Not drawn accurately



Work out the values of x, h and w.

[3 marks]

x = _____ degrees

h = _____ cm

w = _____ cm

Do not write outside the box

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

Do not write outside the box

29 The nth 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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There are no questions printed on this page

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