Please write clearly in block capitals.

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

Surname _____

Forename(s) _____

Candidate signature _____

GCSE
MATHEMATICS

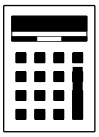
F

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]

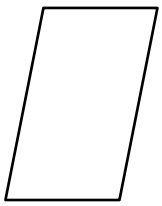
$x = -1$ $x = \frac{2}{3}$ $x = \frac{3}{2}$ $x = 6$

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

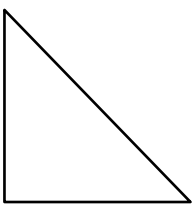
Circle the correct letter.

[1 mark]

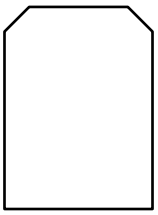
A



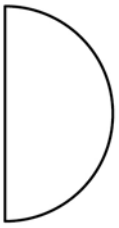
B



C



D



Do not write outside the box

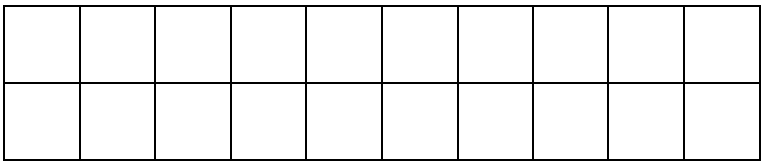
4 Circle the shortest length.

[1 mark]

1200 cm 0.13 km 110 m 140 000 mm

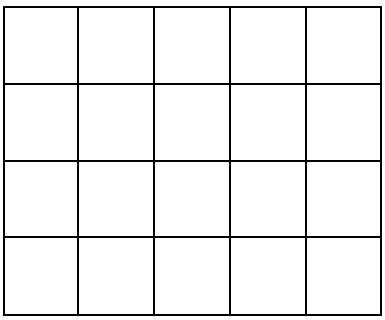
5 (a) Shade $\frac{2}{5}$ of this grid.

[1 mark]



5 (b) Shade 10% of this grid.

[1 mark]



6

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]

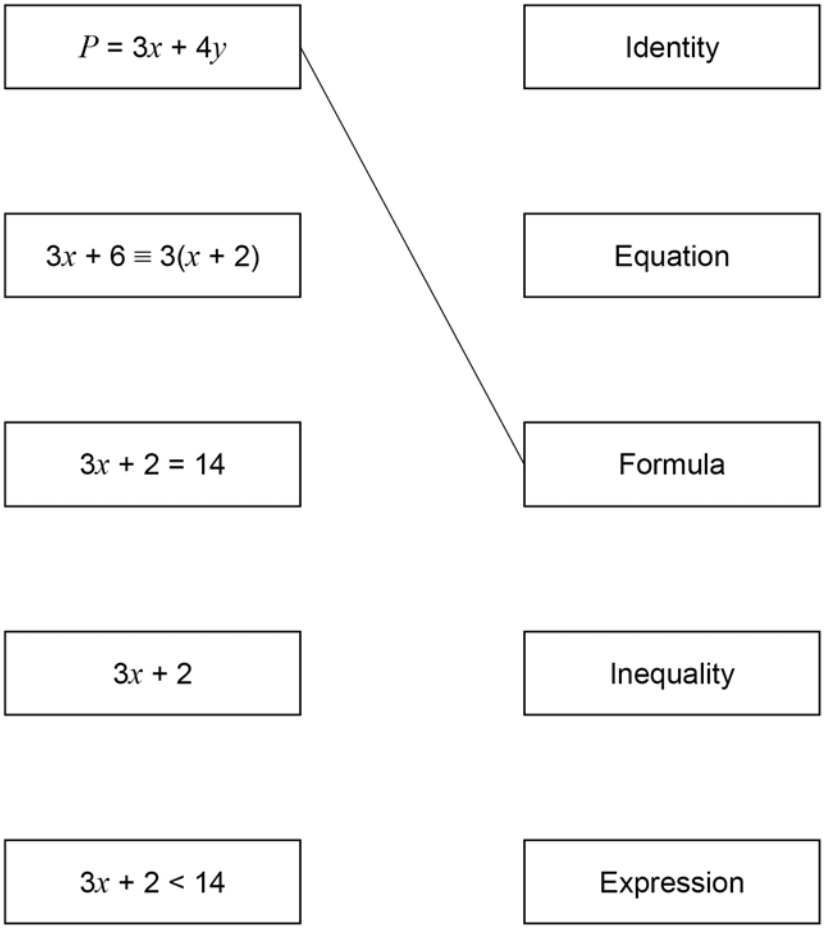
Answer £ _____

Do not write outside the box

7 Link the algebra to the correct description.

One has been done for you.

[3 marks]



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]

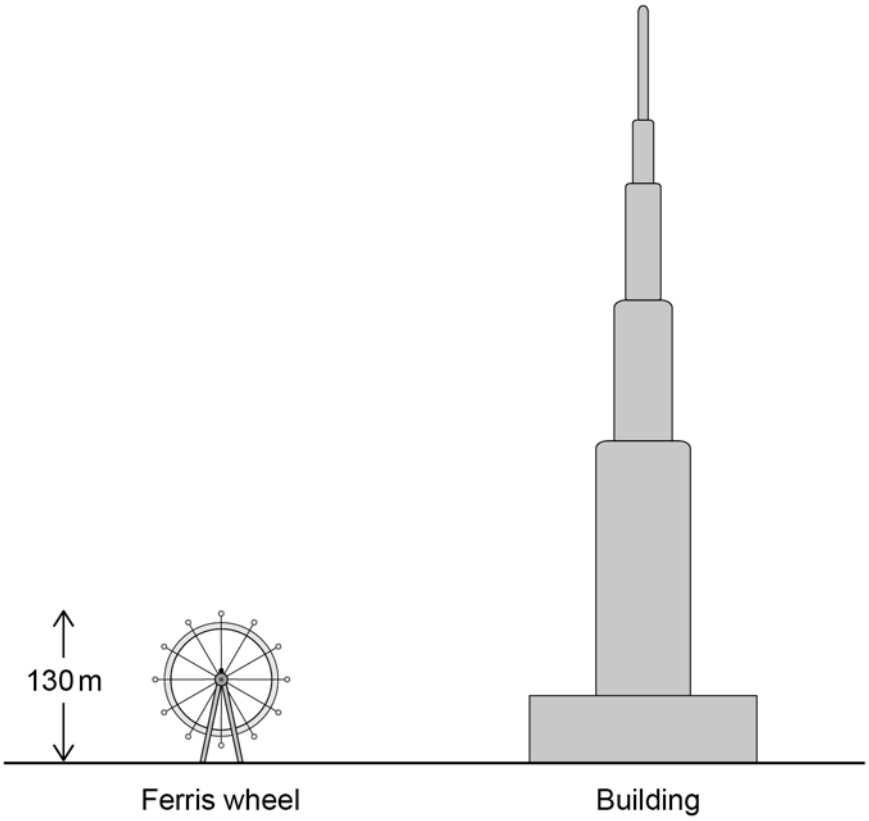
A B C

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

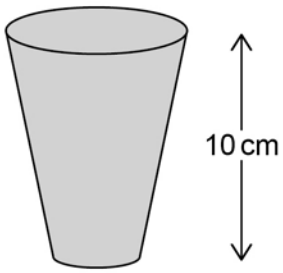
Work out the height of the building.

[3 marks]

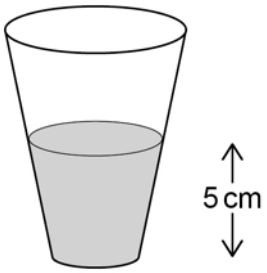
Answer _____ m

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

Do not write outside the box

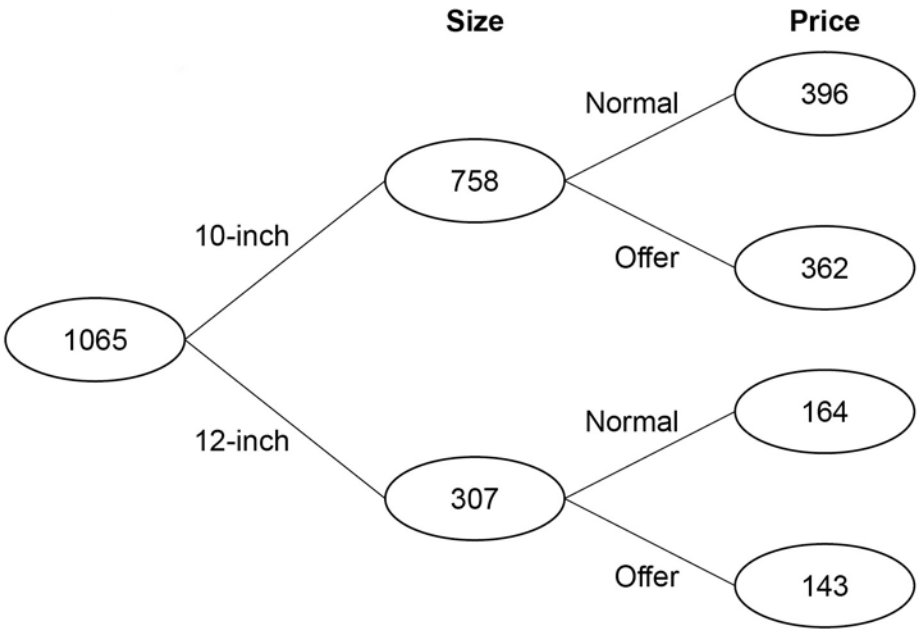
12 A takeaway sells 10-inch pizzas and 12-inch pizzas.

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.

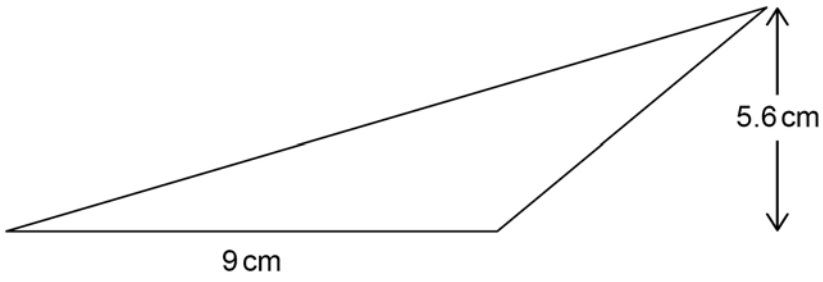
Work out the average speed in miles per hour.

[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]

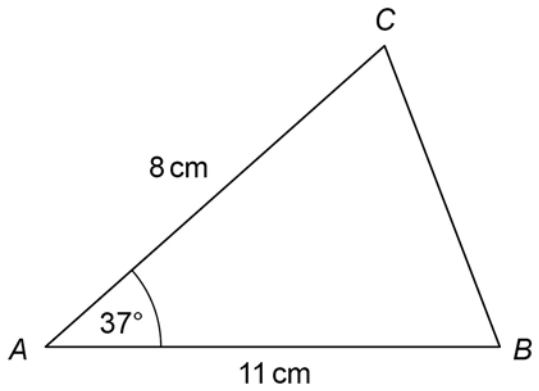
Answer _____

8

Turn over ►

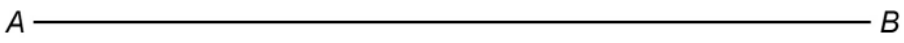
16 A sketch of triangle *ABC* is shown.

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

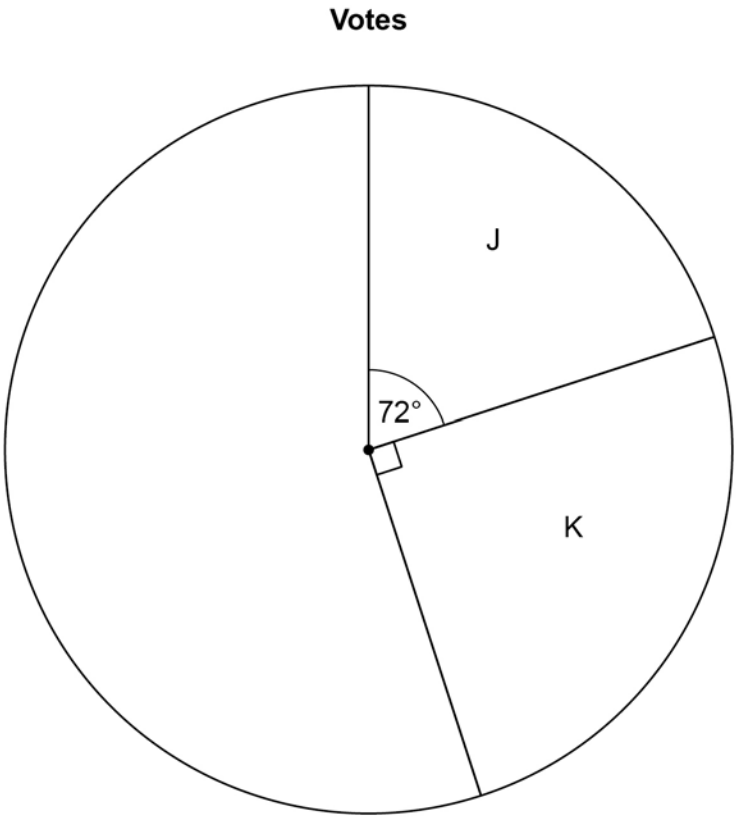
4

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.



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

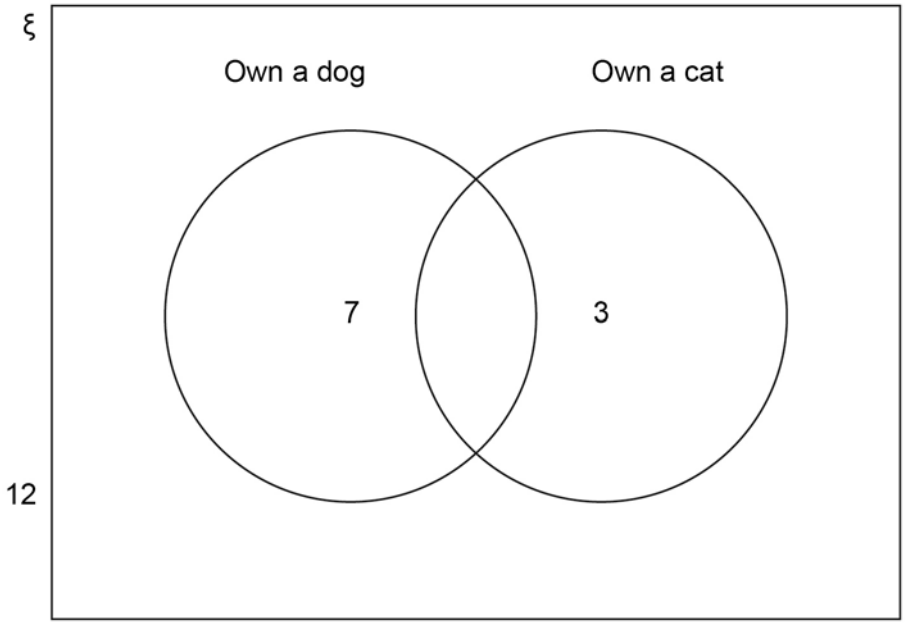
23 In a group of 20 people

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

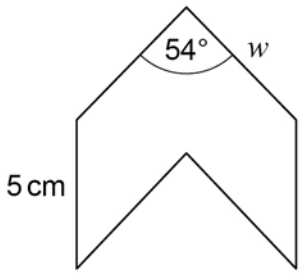
Do not write outside the box

25 A and B are similar shapes.

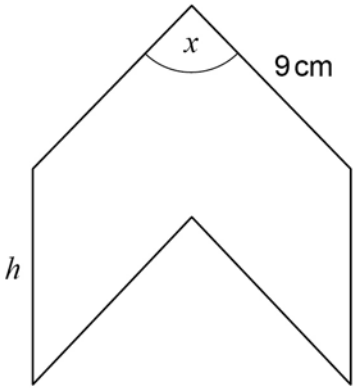
B is an enlargement of A with scale factor 1.5

Not drawn accurately

A



B



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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