Please write clearly in block capitals.

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

Surname _____

Forename(s) _____

Candidate signature _____

GCSE MATHEMATICS

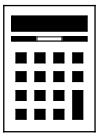
F

Foundation Tier Paper 3 Calculator

Tuesday 13 June 2017 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.
- 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	
TOTAL	

Do not write outside the box

Answer **all** questions in the spaces provided

1 Circle the lowest of these temperatures.

[1 mark]

–4.9°C 0°C –7°C 0.1°C

2 Circle the expression that is four times bigger than n.

[1 mark]

$n + 4$ $4n$ $\frac{n}{4}$ n^4

3 Circle the fraction **greater** than $\frac{3}{10}$

[1 mark]

$\frac{1}{3}$ $\frac{3}{11}$ $\frac{4}{15}$ $\frac{29}{100}$

Do not write outside the box

4 Circle the value of 2^5

[1 mark]

10 25 32 64

5 (a) Simplify $a \times a \times a + b + b$

[2 marks]

Answer _____

5 (b) Simplify $5(x + 3) - x + 2$

[3 marks]

Answer _____

Turn over for the next question

9

Do not write outside the box

6 Twelve cards numbered 1 to 12 are put into six pairs.
Each pair has a total.

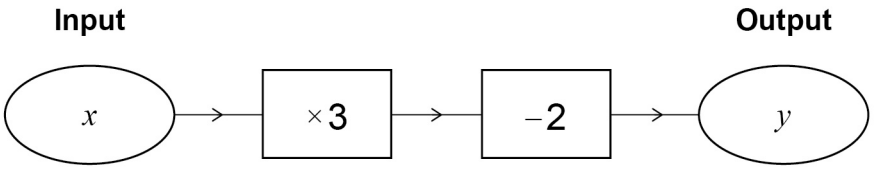
Complete the table to show the pairs and their totals.

[4 marks]

Cards	Total
1 and 2	3
_____ and _____	9
_____ and _____	11
_____ and _____	14
_____ and _____	19
_____ and _____	22

Do not write outside the box

7 Here is a number machine.



7 (a) Work out the output when the input is 4

[1 mark]

Answer _____

7 (b) Work out the output when the input is –4

[1 mark]

Answer _____

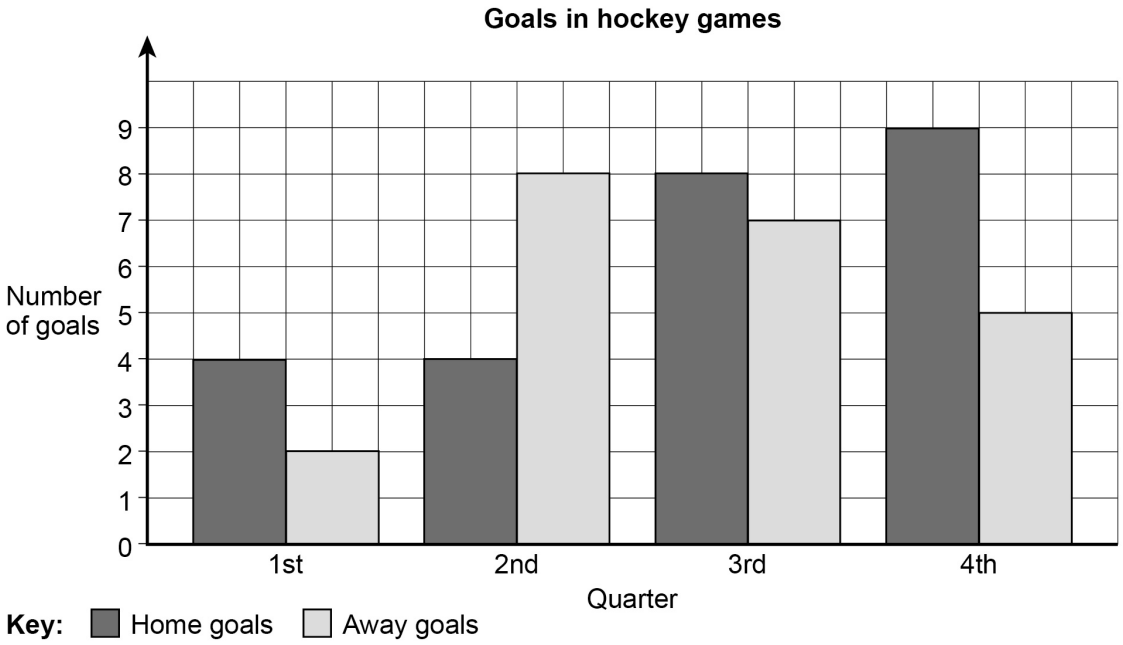
Turn over for the next question

6

Do not write outside the box

8 Here is information about the goals scored in some hockey games.

Each game has four quarters.



8 (a) Which quarter was the mode for **away** goals?

Circle your answer.

[1 mark]

1st 2nd 3rd 4th

8 (b) There were 10 games.

Work out the mean number of goals per game.

[2 marks]

Answer _____

Do not write outside the box

8 (c) In total, how many **more** home goals were scored than away goals?

[2 marks]

Answer _____

8 (d) Rob says,

"More home teams **must** have won because there were more home goals."

Is he correct?

Give a reason for your answer.

[1 mark]

_____

_____

_____

6

Do not write outside the box

9 (a) List **all** the factors of 30

[2 marks]

Answer _____

9 (b) A factor of 30 is chosen at random.

What is the probability that it is a 2-digit number?

[1 mark]

Answer _____

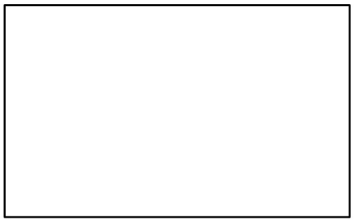
Do not write outside the box

10 Each shape below has an area of 24 cm^2

Complete the missing lengths.

[3 marks]

Rectangle

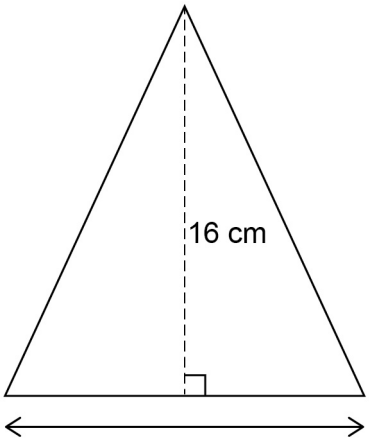


_____ cm

6 cm

Not drawn accurately

Triangle



_____ cm

Turn over for the next question

6

Do not write outside the box

11 A television channel shows 12 minutes of adverts in each half hour.

How many **minutes** of adverts does it show from 5 am to 11 pm?

[3 marks]

Answer _____ minutes

12 Put these probabilities in order, starting with the least likely.

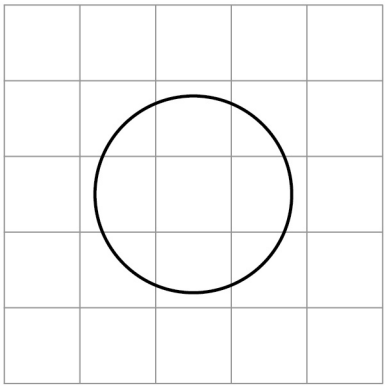
44% $\frac{1}{4}$ 0.404 $\frac{4}{10}$

[2 marks]

Answer _____ , _____ , _____ , _____

Do not write outside the box

13 A circle is drawn on a centimetre grid.



13 (a) Draw a tangent to the circle.

[1 mark]

13 (b) Grace works out that the area of the circle is more than 9 cm^2

Why must this be wrong?

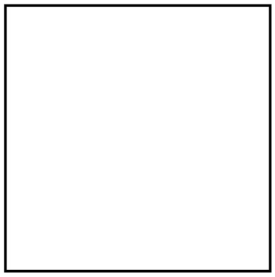
[1 mark]

Turn over for the next question

7

Do not write outside the box

14 (a) The front elevation, side elevation and plan of a solid are all the same, as shown.

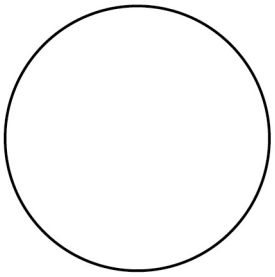


Write down the name of the solid.

[1 mark]

Answer _____

14 (b) The front elevation, side elevation and plan of a solid are all the same, as shown.



Write down the name of the solid.

[1 mark]

Answer _____

Do not write outside the box

15 Show that there are **exactly** five 3-digit cube numbers.

[3 marks]

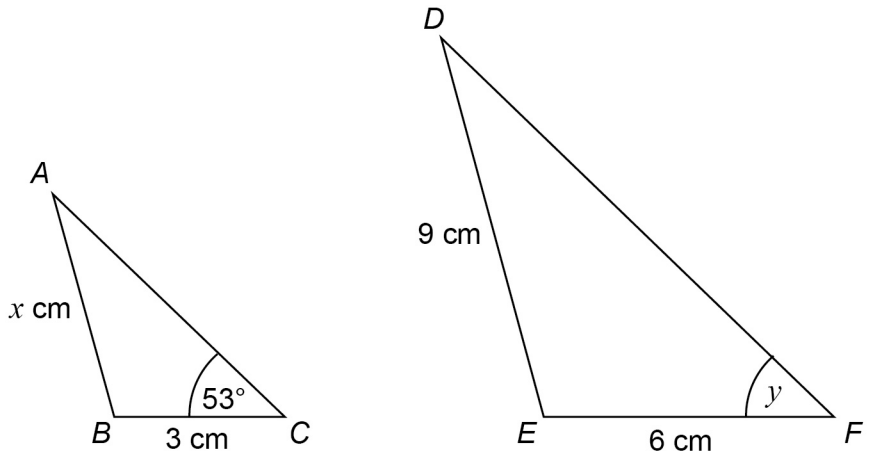
Turn over for the next question

5

Do not write outside the box

16 Triangles *ABC* and *DEF* are similar.

Not drawn accurately



16 (a) Work out the value of x.

[2 marks]

Answer _____

16 (b) Write down the size of angle y.

[1 mark]

Answer _____ degrees

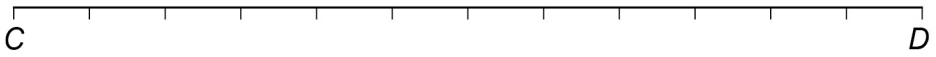
Do not write outside the box

17 *CD* and *PQ* are lines of length 12 cm

17 (a) *CE* : *CD* = 1 : 2

Mark point *E* on the line with a cross.

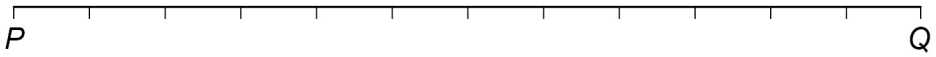
[1 mark]



17 (b) *PR* : *RQ* = 1 : 3

Mark point *R* on the line with a cross.

[1 mark]

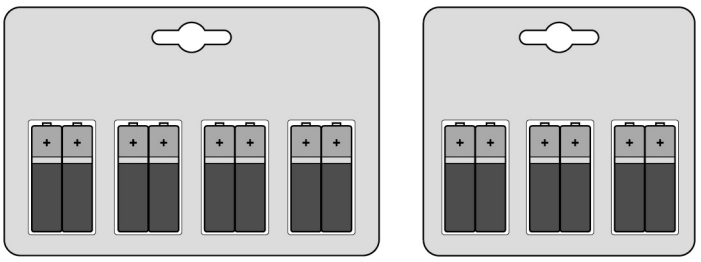


Turn over for the next question

5

Do not write outside the box

18 A shop sells two brands of battery.



Brand A
Pack of 8
Price £3.60

Brand B
Pack of 6
Price £2.94

One brand A battery powers a toy for 5 hours.

One brand B battery powers the same toy for $5\frac{1}{2}$ hours.

Which brand is better value?

You **must** show your working.

[5 marks]

Answer _____

Do not write outside the box

19 The value of x can be 2 or 5

The value of y can be 3 or 12

19 (a) List the possible values of xy

[2 marks]

Answer _____

19 (b) Work out the **least** possible value of $\frac{x-y}{x}$

You **must** show your working.

[2 marks]

Answer _____

Turn over for the next question

9

Do not write outside the box

20 An exam has two papers.

Anil scores

33 out of 60 on paper 1

and

75 out of 100 on paper 2

Work out his percentage score for the exam.

[3 marks]

Answer _____ %

Do not write outside the box

21 Purple paint is made by mixing red paint and blue paint in the ratio 5 : 2

Yan has 30 litres of red paint and 9 litres of blue paint.

What is the **maximum** amount of purple paint he can make?

[3 marks]

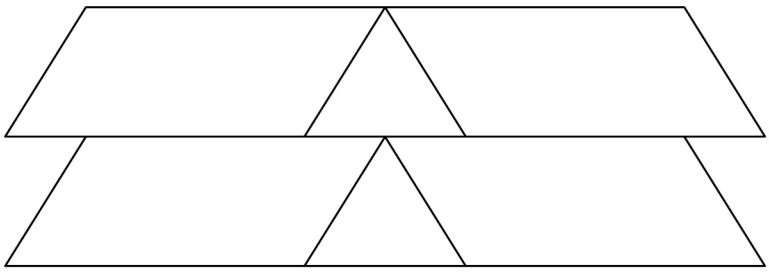
Answer _____ litres

Turn over for the next question

6

Do not write outside the box

22 This shape is made from two triangles and four congruent parallelograms.



Not drawn accurately

For each statement, tick the correct box.

22 (a) The triangles are equilateral.

[1 mark]

☐ Must be true

☐ Could be true

☐ Must be false

22 (b) The triangles are congruent.

[1 mark]

☐ Must be true

☐ Could be true

☐ Must be false

Do not write outside the box

23 (a) The length of a pipe is 6 metres to the nearest metre.

Complete the error interval for the length of the pipe.

[2 marks]

Answer _____ m $\leqslant$ length $<$ _____ m

23 (b) The length of a different pipe is 4 metres to the nearest metre.

Olly says,

"The total length of the two pipes is 11 metres to the nearest metre."

Give an example to show that he could be correct.

[2 marks]

_____

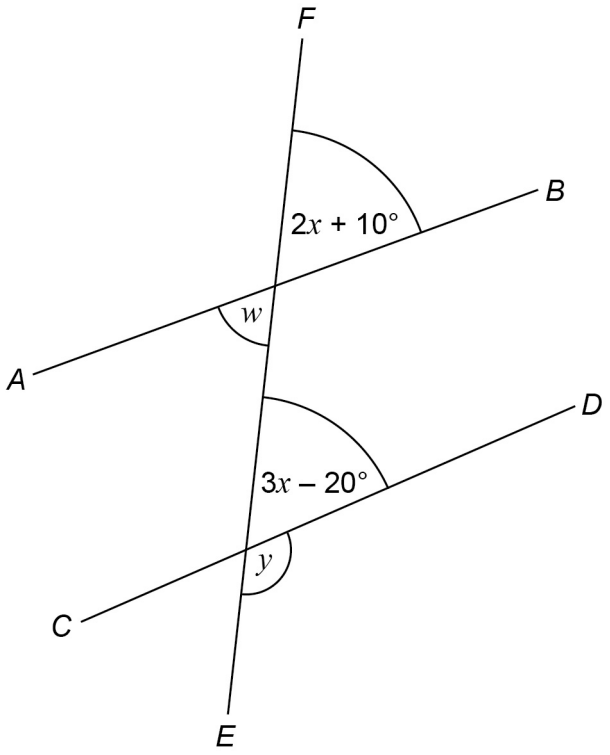
_____

Turn over for the next question

6

Do not write outside the box

24 *AB*, *CD* and *EF* are straight lines.



Not drawn accurately

24 (a) Ava assumes that *AB* and *CD* are parallel.

What answer should she get for the size of angle y?

[4 marks]

Answer _____ degrees

Do not write outside the box

24 (b) In fact,

AB and *CD* are **not** parallel

angle w is 60°

What effect does this have on the size of angle y?

Tick a box.

☐ y is bigger

☐ y is the same

☐ y is smaller

Show working to support your answer.

[3 marks]

Turn over for the next question

7

Do not write outside the box

25 There are 720 boys and 700 girls in a school.

The probability that a boy chosen at random studies French is $\frac{2}{3}$

The probability that a girl chosen at random studies French is $\frac{3}{5}$

25 (a) Work out the number of students in the school who study French.

[3 marks]

Answer _____

25 (b) Work out the probability that a student chosen at random from the whole school does **not** study French.

[2 marks]

Answer _____

Do not write outside the box

26 Circle the expression equivalent to $x^2 - 4x - 12$

[1 mark]

$(x - 4)(x - 8)$ $(x + 3)(x - 4)$ $(x - 12)(x + 1)$ $(x + 2)(x - 6)$

27 How are the whole number solutions to A and B different?

A Solve $3 \leqslant 3x < 18$

B Solve $3 < 3x \leqslant 18$

[2 marks]

END OF QUESTIONS

8

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ANSWER IN THE SPACES PROVIDED

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