

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

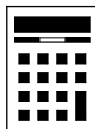
Morning

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.

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	
<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 lowest of these temperatures.

[1 mark]

$-4.9^{\circ}\text{C}$

$0^{\circ}\text{C}$

$-7^{\circ}\text{C}$

$0.1^{\circ}\text{C}$

**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]

$\frac{1}{3}$

$\frac{3}{11}$

$\frac{4}{15}$

$\frac{29}{100}$



**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]**

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Answer \_\_\_\_\_

**5 (b)** Simplify  $5(x + 3) - x + 2$  **[3 marks]**

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Answer \_\_\_\_\_

**Turn over for the next question**



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

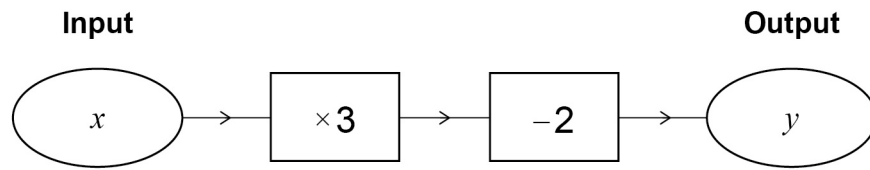
Complete the table to show the pairs and their totals.

**[4 marks]**

<b>Cards</b>	<b>Total</b>
1 and 2	3
_____ and _____	9
_____ and _____	11
_____ and _____	14
_____ and _____	19
_____ and _____	22



7 Here is a number machine.



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

[1 mark]

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Answer \_\_\_\_\_

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

[1 mark]

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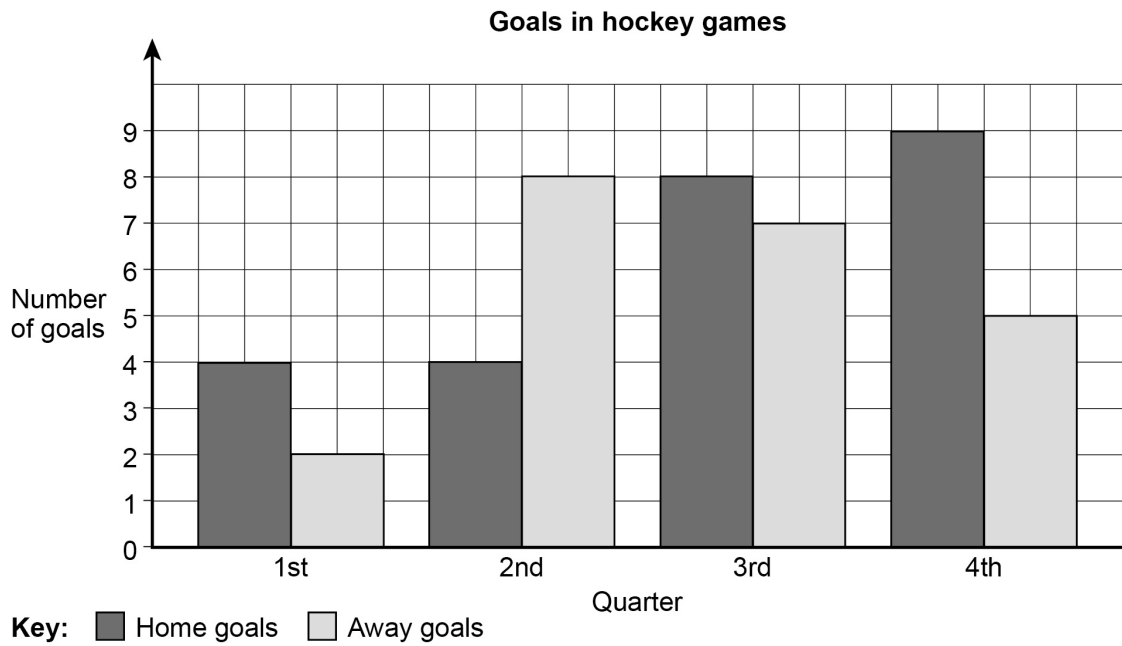
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Answer \_\_\_\_\_

**Turn over for the next question**



- 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]

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Answer \_\_\_\_\_



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

**[2 marks]**

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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]**

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

**[2 marks]**

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Answer \_\_\_\_\_

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

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

**[1 mark]**

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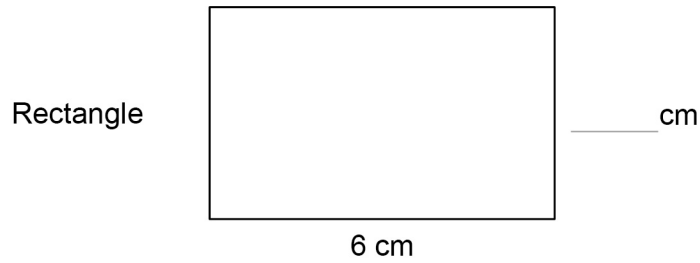
Answer \_\_\_\_\_



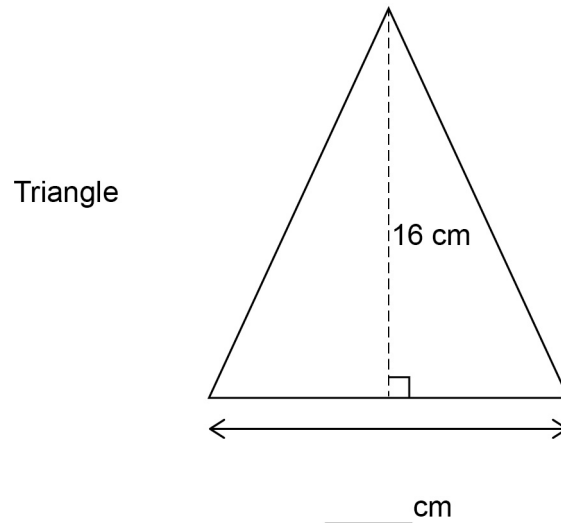


- 10 Each shape below has an area of  $24 \text{ cm}^2$   
Complete the missing lengths.

[3 marks]



Not drawn  
accurately



Turn over for the next question

Turn over ►



**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]**

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Answer \_\_\_\_\_ minutes

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

44%

$\frac{1}{4}$

0.404

$\frac{4}{10}$

**[2 marks]**

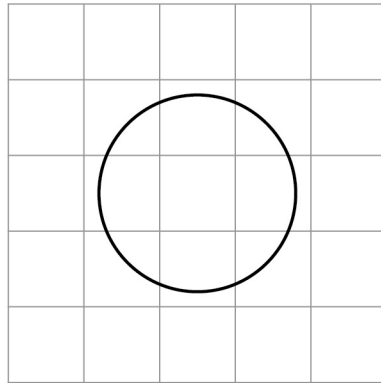
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Answer \_\_\_\_\_ , \_\_\_\_\_ , \_\_\_\_\_ , \_\_\_\_\_



- 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  $9 \text{ cm}^2$

Why must this be wrong?

[1 mark]

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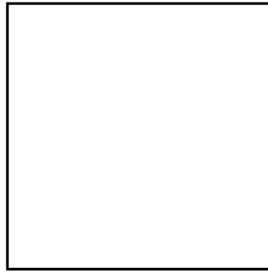
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**Turn over for the next question**



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

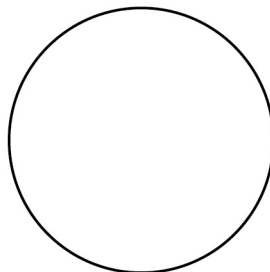


Write down the name of the solid.

**[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 \_\_\_\_\_



15

Show that there are **exactly** five 3-digit cube numbers.**[3 marks]**

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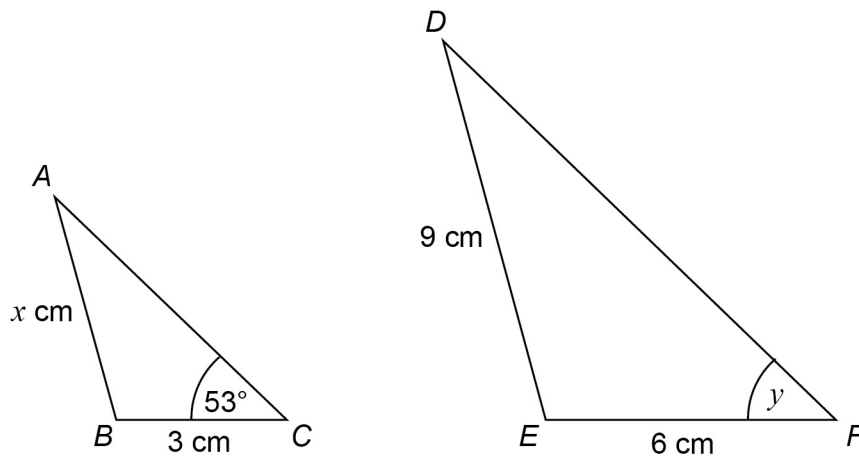
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**Turn over for the next question****5****Turn over ►**

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

Not drawn  
accurately



16 (a) Work out the value of  $x$ .

[2 marks]

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Answer \_\_\_\_\_

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

[1 mark]

Answer \_\_\_\_\_ degrees

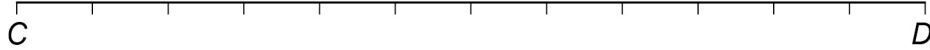


17  $CD$  and  $PQ$  are lines of length 12 cm

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

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

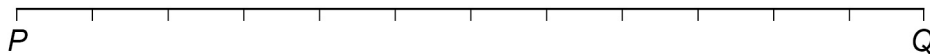
[1 mark]



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

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

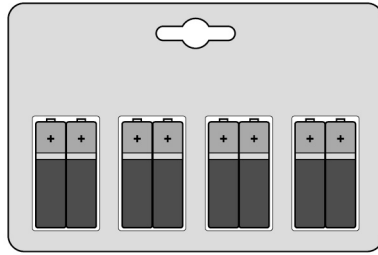
[1 mark]



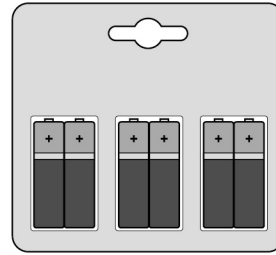
Turn over for the next question



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]

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Answer \_\_\_\_\_





- 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]**

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Answer \_\_\_\_\_

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

You **must** show your working.

**[2 marks]**

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Answer \_\_\_\_\_

**Turn over for the next question**



**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]**

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Answer \_\_\_\_\_ %



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]**

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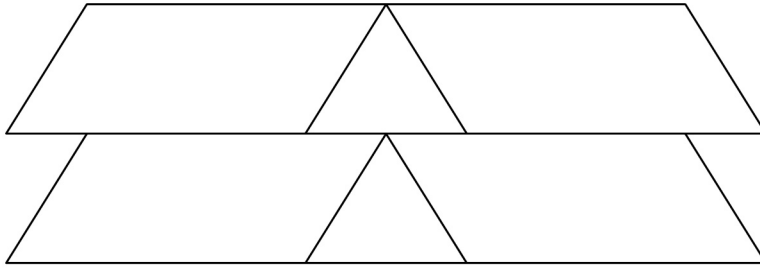
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Answer \_\_\_\_\_ litres

**Turn over for the next question**

**Turn over ►**

- 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



**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  $\leq$  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]**

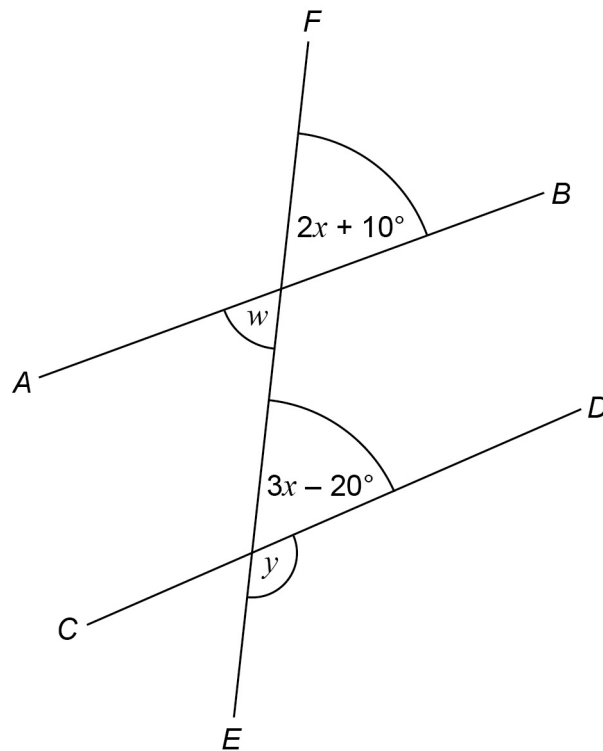
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**Turn over for the next question**



**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]**

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Answer \_\_\_\_\_ degrees



- 24 (b)** In fact,  
 $AB$  and  $CD$  are **not** parallel  
angle  $w$  is  $60^\circ$

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]

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Turn over for the next question

7

Turn over ►



**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]**

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Answer \_\_\_\_\_

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

**[2 marks]**

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Answer \_\_\_\_\_





26

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

[1 mark]

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

27

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

A      Solve  $3 \leq 3x < 18$

B      Solve  $3 < 3x \leq 18$

[2 marks]

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END OF QUESTIONS



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