AQA

Please write clearly in block capitals.

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

Surname

Forename(s) ANSWERS

Candidate signature

GCSE
MATHEMATICS

F

Foundation Tier Paper 3 Calculator

Tuesday 13 June 2017 Morning Time allowed: 1 hour 30 minutes

A

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	

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]

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

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]

$a^3 + 2b$

Answer $a^3 + 2b$

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

[3 marks]

$5x + 15 - x + 2$

$4x + 17$

Answer $4x + 17$

Turn over for the next question

9

6 Twelve cards numbered 1 to 12 are put into six pairs.

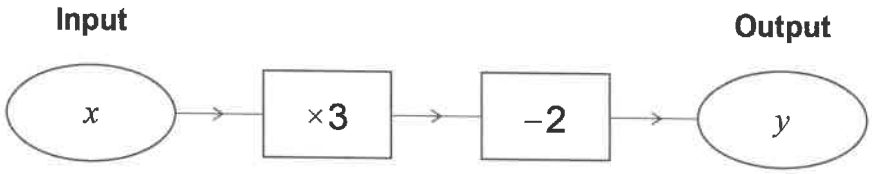
Each pair has a total.

Complete the table to show the pairs and their totals.

[4 marks]

Cards	Total
1 and 2	3
3 and 6	9
4 and 7	11
5 and 9	14
8 and 11	19
10 and 12	22

7 Here is a number machine.



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

[1 mark]

$4 \times 3 - 2$

$12 - 2 = 10$

Answer 10

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

[1 mark]

$-4 \times 3 - 2 = -12 - 2 = -14$

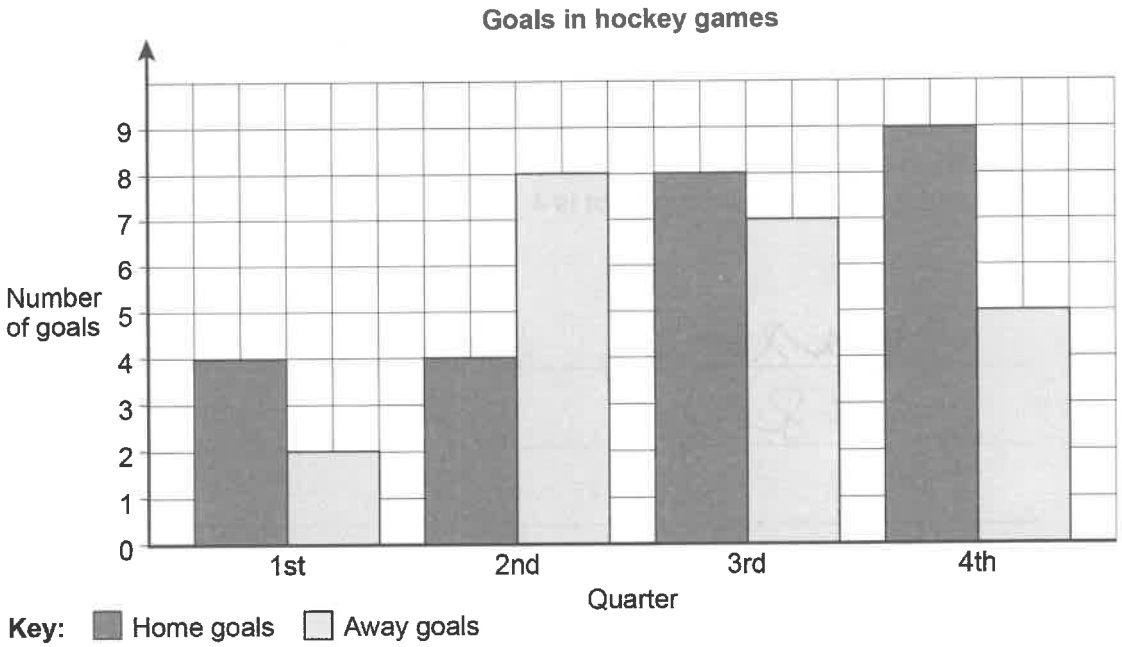
Answer −14

Turn over for the next question

6

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? most popular

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]

$(4+2+4+8+8+7+9+5) \div 10$

$47 \div 10$

Answer 4.7

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

[2 marks]

$4+4+8+9=25$

$2+8+7+5=22$

$25-22=3$

Answer 3.

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]

No

One or more home teams might have won a game or games by a lot of goals.

6

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

[2 marks]

1x30, 2x15, 3x10, 5x6

Answer 1, 2, 3, 5, 6, 10, 15, 30

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

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

[1 mark]

8 factors $\frac{3}{8}$

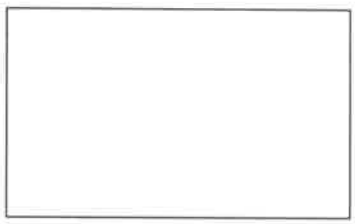
Answer $\frac{3}{8}$

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

Complete the missing lengths.

[3 marks]

Rectangle



4 cm

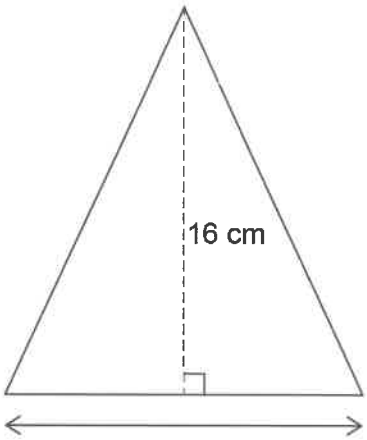
$6x ? = 24$

$? = 24 \div 6$

$? = 4$

Not drawn accurately

Triangle



3 cm

$\frac{? \times 16}{2} = 24$

$? \times 8 = 24$

$? = 3$

Turn over for the next question

6

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]

5.00 2300 23-5 = 18 hours

In 18 hours, there are 36 half hours.

36 × 12 = 432

Answer 432 minutes

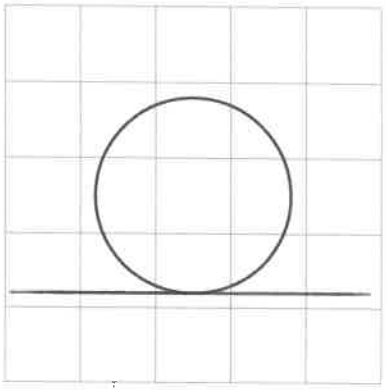
12 Put these probabilities in order, starting with the least likely.

44%	$\frac{1}{4}$	0.404	$\frac{4}{10}$
44%	25%	40·4%	40%

[2 marks]

Answer $\frac{1}{4}$, $\frac{4}{10}$, 0·404 , 44%

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?

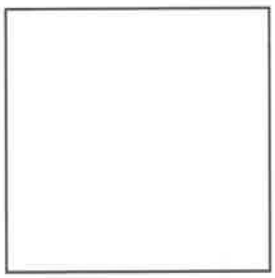
[1 mark]

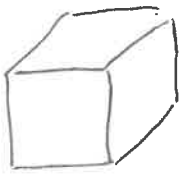
Thea area of the square around it is $3 \times 3 = 9cm^2$. The square is bigger than the circle so it must be wrong.

Turn over for the next question

7

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



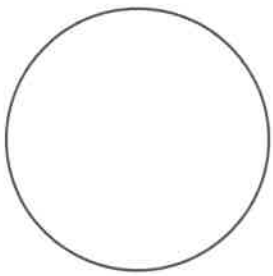


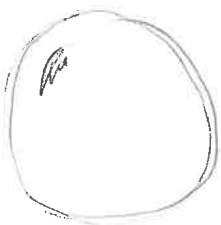
Write down the name of the solid.

[1 mark]

Answer Cube

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 sphere

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

[3 marks]

$5^3 = 125$

$6^3 = 216$

$7^3 = 343$

$8^3 = 512$

$9^3 = 729$

AND $4^3 = 64$ $10^3 = 1000$

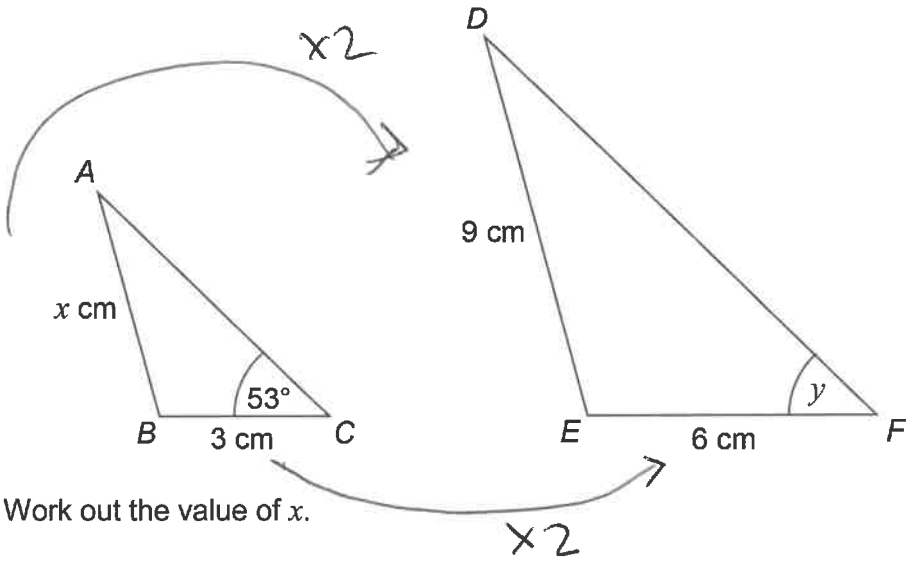
so only 5 3 digit cube numbers

Turn over for the next question

5

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

Not drawn accurately



16 (a) Work out the value of x.

[2 marks]

$x \times 2 = 9$

$x = \frac{9}{2}$

Answer 4.5

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

angles are same in similar shapes **[1 mark]**

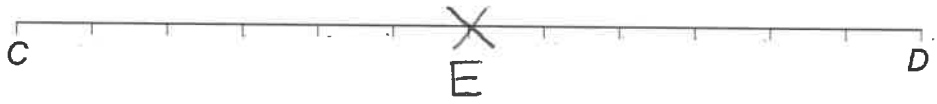
Answer 53° degrees

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

17 (a) *CE* : *CD* = 1 : 2 MAO CD must be double CE

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

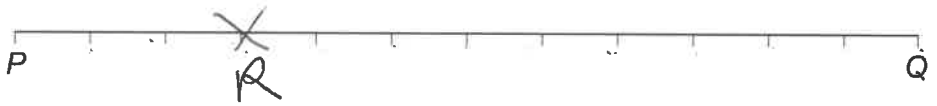
[1 mark]



17 (b) *PR* : *RQ* = 1 : 3 1+3=4 12÷4=3

Mark point *R* on the line with a cross. 3:9

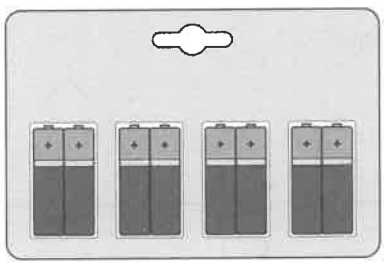
[1 mark]



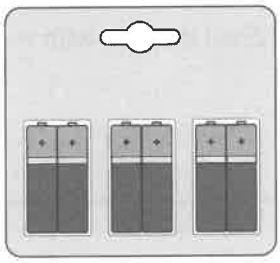
Turn over for the next question

5

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]

£ Brand A. 8 x 5 hours = 40 hours.

£3.60 = 40 hours

£1 = 40 ÷ 3.60

£1 = 11.1 hours

Brand B 6 x $5\frac{1}{2}$ = 33 hours.

£2.94 = 33 hours

£1 = 33 ÷ 2.94

£1 = 11.22 hours

Answer Brand B is better value

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]

$2 \times 3 = 6 \quad 2 \times 12 = 24 \quad 5 \times 3 = 15 \quad 5 \times 12 = 60$

Answer 6, 15, 24, 60

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

You **must** show your working.

[2 marks]

$\frac{2-12}{2} = -5 \quad \frac{2-3}{2} = -\frac{1}{2} \quad \frac{5-3}{5} = \frac{2}{5}$

$\frac{5-12}{5} = -\frac{7}{5}$

Answer -5

Turn over for the next question

9

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]

$33+75=108$

$60+100=160$

$\frac{108}{160}=0.675$

$0.675\times100=67.5\%$

Answer 67.5 or 68 %

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]

R B

×6 (5 : 2) ×6

30 : 12 ✗ can't do 12 litres of blue

R B

×4.5 (5 : 2) ×4.5

22.5 9

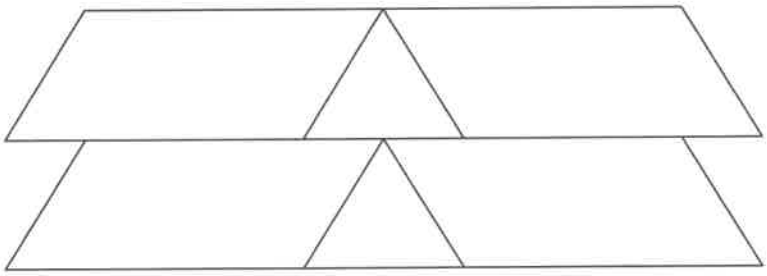
22.5 + 9 =

Answer 31.5 litres

Turn over for the next question

6

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 5.5 m ⩽ length < 6.5 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]

$3.5 \leqslant 4 < 4.5$

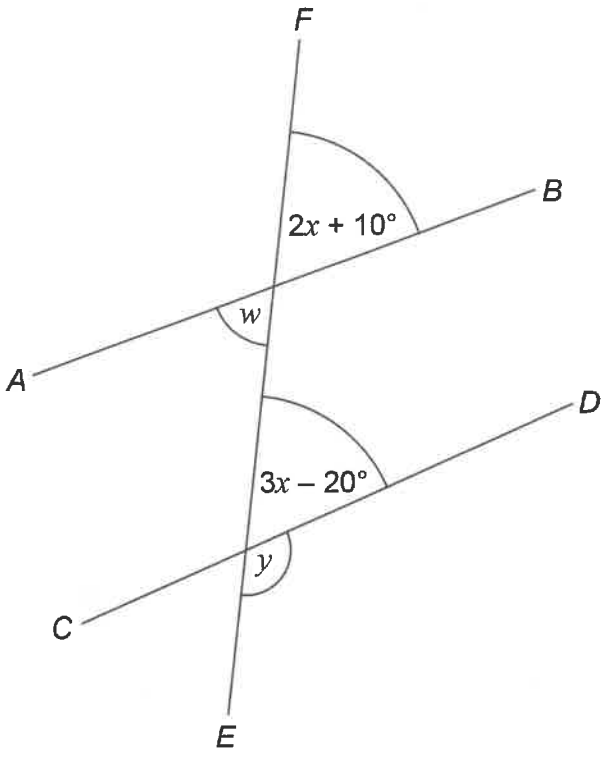
$6.5 + 4.5 = 11$

He could be correct

Turn over for the next question

6

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



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

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

[4 marks]

$3x - 20 = 2x + 10$

$-2x \qquad -2x$

$x - 20 = 10 \qquad x = 30$

$3x - 20$

$90 - 20 = 70 \qquad 180 - 70 = 110°$

Answer 110° degrees

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]

$w = 60$ $2x + 10 = 60$ $2x = 50$

$x = 25°$

$3x - 20 \Rightarrow 3 \times 25 - 20 = 75 - 20 = 55$

$y - 55 = 180$ $y = 125$

Turn over for the next question

7

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]

$\frac{2}{3} \times 720 = 480$ boys +

$\frac{3}{5} \times 700 = 420$ girls

900 students

Answer 900

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

[2 marks]

1420 in school.

$1420 - 900 = 520$

Answer $\frac{520}{1420} = \frac{26}{71}$

different signs

Do not write outside the box

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

[1 mark]

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

$3x - 4x = -x$ ✗

$x - 12x = -11x$

$2x - 6x = -4x$ ✓

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]

A $3 \leq 3x < 18 \Rightarrow 1 \leq x < 6$

1, 2, 3, 4, 5

B $3 < 3x \leq 18 \Rightarrow 1 < x \leq 6$

2, 3, 4, 5, 6

A is 1, 2, 3, 4, 5 B is 2, 3, 4, 5, 6

END OF QUESTIONS

8

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