AQA

Please write clearly in block capitals.

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

Surname _____

Forename(s) _____

Candidate signature _____

GCSE MATHEMATICS

F

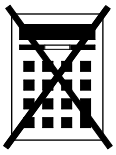
Foundation Tier Paper 1 Non-Calculator

Tuesday 5 November 2019 Morning Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:
- mathematical instruments

You must **not** use a calculator.



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	
TOTAL	

Answer **all** questions in the spaces provided

Do not write outside the box

1 Circle the value of the digit 9 in the number 7.962

[1 mark]

$\frac{9}{1000}$ 0.009 $\quad \frac{9}{100}$ 0.09 $\quad \frac{9}{10}$ 0.9 $\quad 9$

(1)

2 Solve $3x = 6$ $x = \frac{6}{3} = 2$

Circle your answer.

[1 mark]

$x = 0.5$ $\quad x = 2$ $\quad x = 3$ $\quad x = 18$

(1)

3 Circle the correct statement. $\frac{1}{4} = 0.25$

[1 mark]

$0.3 > \frac{1}{4}$ $\quad 0.3 = \frac{1}{4}$ $\quad 0.3 \leqslant \frac{1}{4}$ $\quad 0.3 < \frac{1}{4}$

(1)

Do not write outside the box

4 Circle the number that is closest in value to $\sqrt{50}$

[1 mark]

5 7 8 25

$\sqrt{49}$ (1)

5 Work out 76×24

[3 marks]

$76 \times 20 + 76 \times 4$

$= 1520$ (1) $+ 304$ (1)

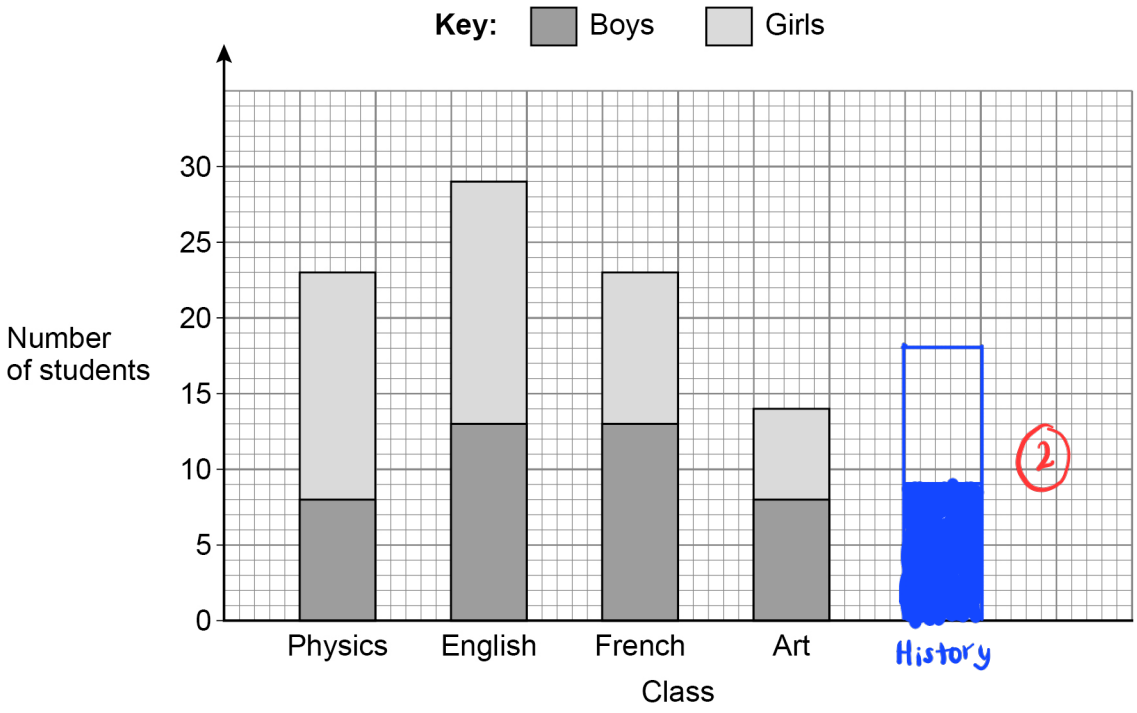
$= 1824$ (1)

Answer 1824

7

Do not write outside the box

6 The composite bar chart shows the number of students in some classes.



6 (a) How many boys are in the Physics class?

[1 mark]

Answer 8 (1)

6 (b) How many girls are in the English class?

[1 mark]

29 - 13

Answer 16 (1)

6 (c) Which **two** classes have the same total number of students?

[1 mark]

Answer Physics (1) and French

Do not write outside the box

6 (d) In the History class

there are 18 students

number of boys = number of girls

Show this information on the bar chart.

[2 marks]

7 (a) Work out 1.86 ÷ 6

$$6\overline{)1.86} = 0.31$$

-1.8

0.6

-6

0

[1 mark]

Answer 0.31 (1)

7 (b) Work out 0.4 × 0.2

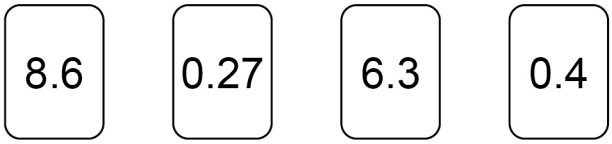
[1 mark]

Answer 0.08 (1)

7

Do not write outside the box

8 Here are four number cards.



8 (a) Choose **two** of the cards to make the answer to this calculation a whole number.
Include the answer to the calculation.

[2 marks]

8.6 + 0.4 = 9 (1)

(1)

8 (b) Choose **two** of the cards to make the answer to this calculation as large as possible.
Include the answer to the calculation.

[2 marks]

(1)

8.6 − 0.27 = 8.33 (1)

largest smallest

Do not write outside the box

9

Rulers	Pens
85p each	£3.50 each

Jenny buys 5 rulers and 2 pens.

She works out how much she should pay.

$5 \times 85p = £4.25$

$2 \times £3.50 = £6.10$

Total = £10.35

Jenny's total is wrong.

What mistake has she made?

Include the correct total in your answer.

[2 marks]

Mistake made 2 x £3.50 should be £7.00 (1)

Correct total £ 11.25 (1)

Turn over for the next question

6

Do not write outside the box

10 Here are three calculations, A, B and C.

A	**B**	**C**
100 × 20 000	1 million ÷ 2	4 × 100 000

Put the calculations in order.

Start with the calculation that has the smallest answer.

You **must** show the answer to each calculation.

[3 marks]

A : 100 × 20000 = 2 000 000 (1)

B : 1 000 000 ÷ 2 = 500 000

C : 4 × 100 000 = 400 000 (1)

Smallest C

B (1)

Largest A

Do not write outside the box

11 In a raffle, 200 tickets are sold.
The tickets are either red or blue.

The winning ticket is picked at random.

11 (a) What is the probability that the winning ticket is green?

[1 mark]

Answer 0 (1)

11 (b) 79 children and 90 women buy one ticket each.
Men buy the rest of the tickets.

Work out the probability that a man buys the winning ticket.

[2 marks]

Men : 200 - 90 - 79 = 31 (1)

Answer $\frac{31}{200}$ (1)

Turn over for the next question

6

Do not write outside the box

12 A college has

a total of 105 teachers

19 more female teachers than male teachers.

What proportion of the teachers are female?

[3 marks]

Let x = male teachers

$x + 19$ = female teachers

$x + x + 19 = 105$ (1)

$x = 43$

female = $43 + 19 = 62$ (1)

Answer $\frac{62}{105}$ (1)

13 By rounding each number to the nearest 10, estimate the value of $262 \div 19.8$

[2 marks]

$262 \rightarrow 260$, $19.8 \rightarrow 20$ (1)

$260 \div 20 = 13$

Answer 13 (1)

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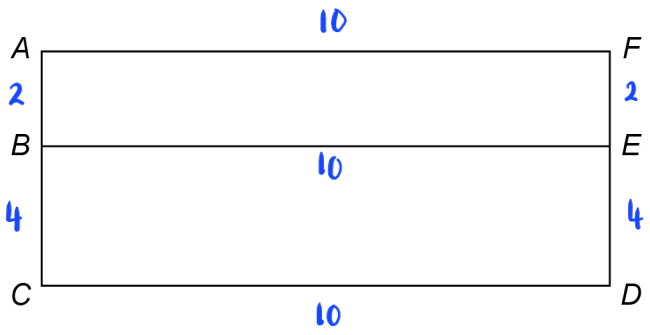
14 *ABEF* and *ACDF* are rectangles.

AF = 10 cm *AB* = 2 cm *BC* = 4 cm



Not drawn accurately

Work out

perimeter *ABEF* : perimeter *ACDF*

Give your answer in its simplest form.

[3 marks]

ABEF : 2 + 2 + 10 + 10 = 24 (1)

ACDF : 6 + 10 + 6 + 10 = 32 (1)

÷8 (24 : 32) ÷8

3 : 4

(1)

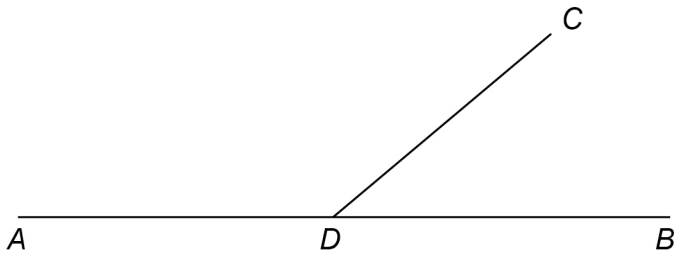
Answer 3 : 4

Turn over for the next question

8

Do not write outside the box

15 *ADB* and *CD* are straight lines.



Not drawn accurately

angle *ADC* = 5 × angle *CDB*

Work out the size of angle *ADC*.

[3 marks]

ADC : CDB = 5 : 1 (1)

180° ÷ 6 = 30° (1)

ADC : 5 × 30° = 150° (1)

Answer 150 degrees

16 Circle the value of 5^3

[1 mark]

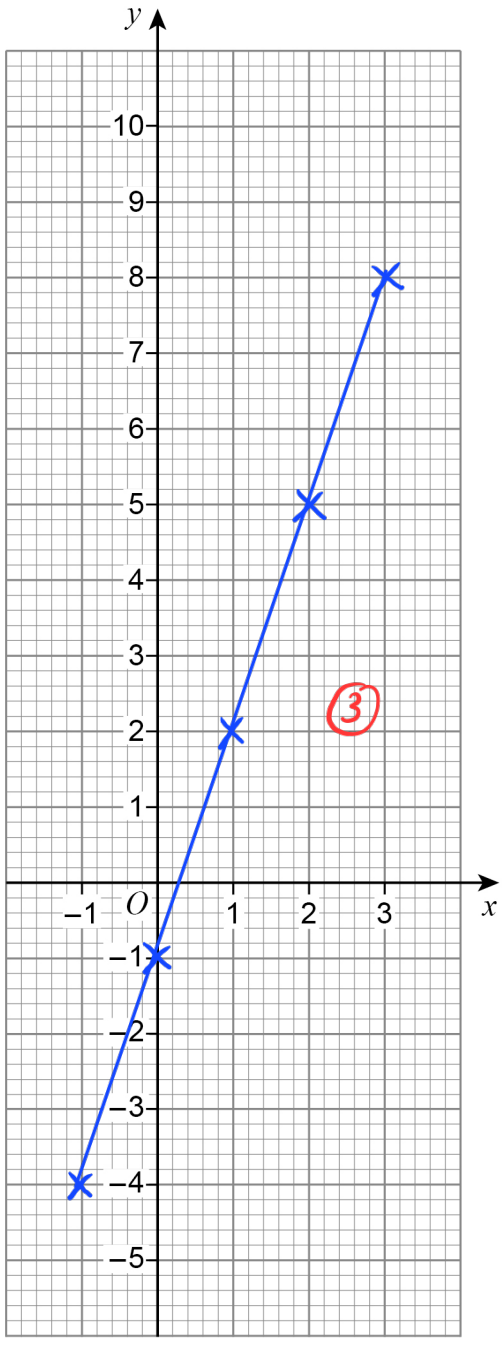
8 (5+3) 15 (5×3) 25 (5^2) 125 (1)

Do not write outside the box

17 Draw the graph of $y = 3x - 1$ for values of x from –1 to 3

[3 marks]

x	-1	0	1	2	3
y	-4	-1	2	5	8



7

Do not write outside the box

18 Mo played 30 games of chess.

He won 18 of these games.

18 (a) What fraction of the games did he win?

Give your answer in its simplest form.

[2 marks]

$18 \div 6 = 3$

$30 \div 6 \quad 5$ (2)

Answer $\frac{3}{5}$

18 (b) He played 20 more games.

He had then won 64% of **all** of his games.

How many of the 20 games did he win?

[3 marks]

$\frac{64}{100} \times (30 + 20) = 32$ games (1) (1)

$32 - 18 = 14$ (1)

Answer 14

Do not write outside the box

19 (a) In a field

number of sheep : number of cows = 10 : 3

Zak says,

"There are 10 sheep in the field."

Give a reason why Zak **could** be wrong.

[1 mark]

The number of sheeps could be any multiple of 10. (1)

19 (b) In a different field

number of goats : number of pigs = 13 : 4

Priya says,

"There are more than three times as many goats as pigs."

Is she correct?

Tick **one** box.

✓	Yes		No		Cannot tell

(1)

Show working to support your answer.

[1 mark]

$13 \div 4 = 3.25 > 3$.

7

Do not write outside the box

20 An ordinary fair dice is rolled.

$P(A) = \frac{5}{6}$

Which could be a correct statement about event A?

Tick **one** box.

[1 mark]

- ☐ The number rolled is even
- ☑ The number rolled is greater than 1 (1)
- ☐ The number rolled is less than 5
- ☐ The number rolled is prime

21 Solve $8x + 7 = 2x + 10$

[3 marks]

$8x - 2x = 10 - 7$ (1)

$6x = 3$ (1)

$x = \frac{3}{6}$

$= \frac{1}{2}$ (1)

$x = \frac{1}{2}$

Do not write outside the box

22 In a **right-angled** triangle

smallest angle : largest angle = 2 : 5

Work out the three angles of the triangle.

[4 marks]

$180^\circ - 90^\circ = 90^\circ$

$90^\circ \div 5 = 18^\circ$ (1)

$2 \times 18^\circ = 36^\circ$ (1)

$90^\circ - 36^\circ = 54^\circ$

(1)

90 degrees

54 (1) degrees

36 degrees

23 Which **one** of the following is discrete data?

Circle your answer.

[1 mark]

length of arm | height of door | number of pets | mass of sugar

(1)

9

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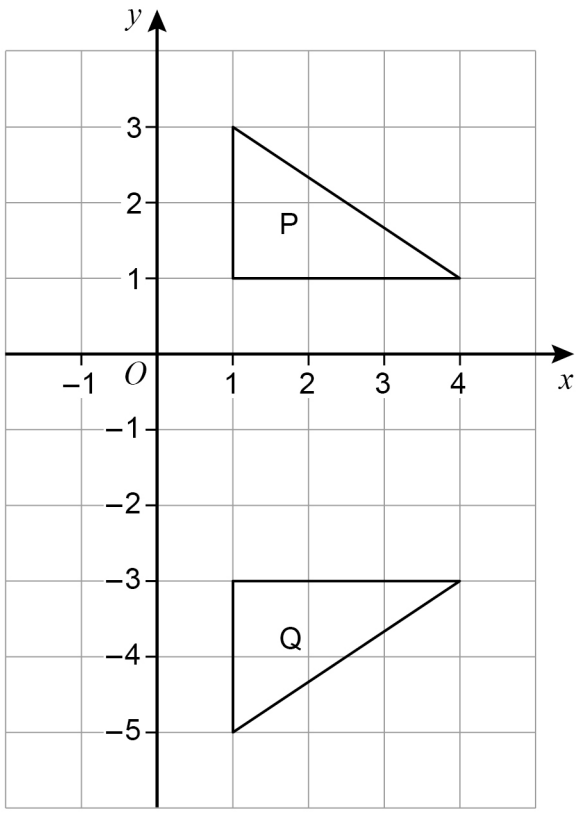
24 (a) Here are two triangles, P and Q.



Here is a statement.

A transformation that maps P to Q is a reflection in the line $x = -1$

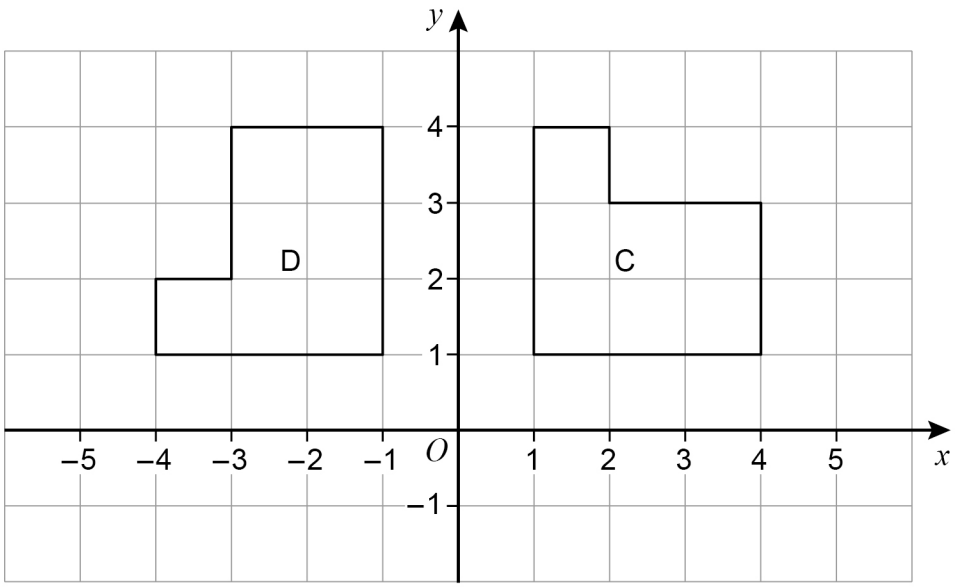
Make **one** criticism of the statement.

[1 mark]

Should be
A Reflection in the line $y = -1$. (1)

Do not write outside the box

24 (b) Here are two shapes, C and D.



Here is a statement.

> A transformation that maps C to D is a rotation through 90° anticlockwise.

Make **one** criticism of the statement.

[1 mark]

Missing centre of rotation at point O. (1)

Turn over for the next question

2

Do not write outside the box

25 (a) A geometric progression starts 4 16

Work out the next term.

[1 mark]

$a = 4$, $r = 4$

$T_3 = 4 \times 4^2$

$= 64$

Answer 64 (1)

25 (b) A Fibonacci-type sequence starts 3 –8

The sequence is continued by adding the previous two terms.

Work out the next **two** terms.

[2 marks]

3, −8, (3 − 8), (−8 + (3 − 8))

3, −8, −5, −13

Answer −5 (1) and −13 (1)

Do not write outside the box

26 Given that $a \times 60 = b$ work out the value of $\frac{4b}{a}$

[2 marks]

$b = 60a$

$\frac{4(60a)}{a} = 240$ (1) (1)

Answer 240

27 Write $27 \times \left(3^2\right)^7$ as a single power of 3

[3 marks]

(1) $3^3 \times 3^{14}$ (1)

$= 3^{3+14}$

$= 3^{17}$ (1)

Answer 3^{17}

Turn over for the next question

8

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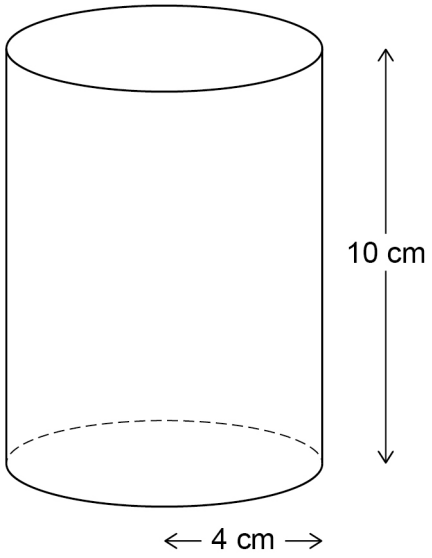
28 Here are two solids.

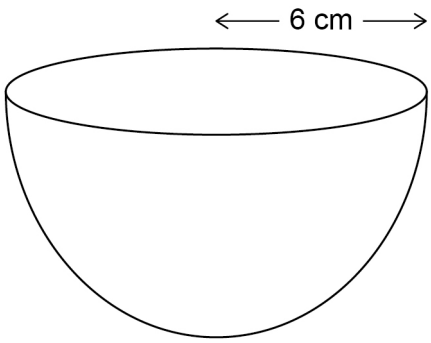
Cylinder

radius 4 cm height 10 cm



Hemisphere

radius 6 cm



volume of a hemisphere $= \frac{2}{3}\pi r^3$ where r is the radius

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Which solid has the greater volume?

You **must** show your working.

[4 marks]

Volume of cylinder : $\pi \times 4^2 \times 10$

$= 160\pi$ (1)

Volume of a hemisphere : $\frac{2}{3} \times \pi \times 6^3$ (1)

$= \frac{2}{3}(216) \times \pi$

$= 144\pi$ (1)

Answer cylinder (1)

Turn over for the next question

4

Do not write outside the box

29 Saj makes Rose Pink paint and Cherry Pink paint.

He mixes red paint with white paint as shown.

Rose Pink	**Cherry Pink**
red : white = 1 : 2	red : white = 4 : 3

He makes 60 litres of Rose Pink paint.

To this Rose Pink paint he adds

80 litres of red paint and 28 litres of white paint.

Has he now made Cherry Pink paint?

You **must** show your working.

[4 marks]

60 ÷ 3 = 20 litres (1)

Initially : rose pink = 20 litre red + 40 litre white

After added : 20 + 80 red , 40 + 28 white

= 100 red (1) , 68 white (1)

red : white = $\frac{100}{4}$: $\frac{28}{4}$ = 25 : 17.

No. He does not make Cherry Pink paint. (1)

Do not write outside the box

30 (a) Work out $\dfrac{2 \times 10^{14}}{8 \times 10^{9}}$

Give your answer in standard form.

[2 marks]

$\frac{2}{8} \times 10^{14-9}$

$= 0.25 \times 10^{5}$ (1)

$= 2.5 \times 10^{4}$ (1)

Answer 2.5×10^{4}

30 (b) $6200.07 = 6.2 \times 10^{c} + 7 \times 10^{d}$

Work out the values of c and d.

[2 marks]

$6.2 \times 1000 = 6200$, $c = 3$

$7 \times 0.01 = 0.07$, $d = -2$

$c =$ 3 (1) $d =$ -2 (1)

Turn over for the next question

8

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31 $V = \frac{k}{H}$ where k is a constant.

Which **two** statements are correct?

Tick **two** boxes.

[1 mark]

- ☐ V is directly proportional to H
- ☑ V is inversely proportional to H
- ☑ V is directly proportional to $\frac{1}{H}$
- ☐ V is inversely proportional to $\frac{1}{H}$

(1)

END OF QUESTIONS

1

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