AQA

Please write clearly in block capitals.

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

Surname _____

Forename(s) _____

Candidate signature _____

I declare this is my own work.

GCSE MATHEMATICS

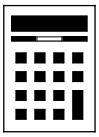
F

Foundation Tier Paper 2 Calculator

Monday 3 June 2024 Morning Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:
- a calculator
- mathematical instruments
- the Formulae Sheet (enclosed).



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.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- 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	
TOTAL	

Answer **all** questions in the spaces provided.

Do not write outside the box

1 (a) Write 0.27 as a fraction.

[1 mark]

Answer 27/100 ✓1

1 (b) Write $\frac{2}{5}$ as a decimal.

2 ÷ 5 = 0.4

[1 mark]

Answer 0.4 ✓1

1 (c) Write 0.35 as a percentage.

[1 mark]

Answer 35 ✓1 %

Do not write outside the box

2 (a) Simplify fully $x + 4x$

[1 mark]

Answer 5x ✓1

2 (b) Simplify fully $5 \times 2w$ = (5×2)w = 10w

[1 mark]

Answer 10w ✓1

2 (c) Simplify fully $2m \div m$ $2\left(\frac{m}{m}\right) = 2$

[1 mark]

Answer 2 ✓1

2 (d) Simplify fully $y \times y \times y$ $= y^{1+1+1} = y^3$

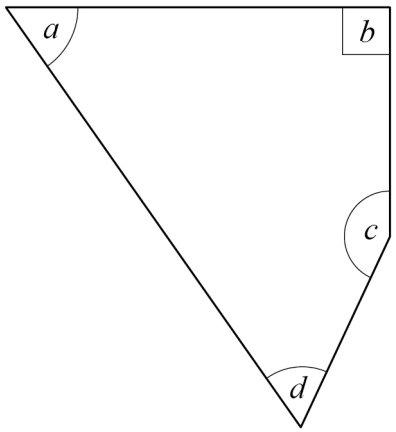
[1 mark]

Answer y^3 ✓1

7

Do not write outside the box

3 Here is a quadrilateral.



→ $90° < \theta < 180°$

3 (a) Write down the letter of the obtuse angle.

[1 mark]

Answer c ✓ (1)

3 (b) Write down the letter of an acute angle.

[1 mark]

Answer d ✓ (1)

3 (c) How many lines of symmetry does the shape have?

[1 mark]

Answer 0 ✓ (1)

Do not write outside the box

4 (a) One lettuce costs £1.29

How much do **seven** of these lettuces cost?

[1 mark]

£1.29 × 7 = £9.03

2 6
1.29
× 7
9.03

Answer £ 9.03 ✓ 0

4 (b) Five cucumbers cost £6.40 in total.

How much do **two** of these cucumbers cost?

[1 mark]

1 cucumber = £6.40 ÷ 5 = £1.28

2 cucumbers = £1.28 × 2 = £2.56

1.28
5)6.40
−5↓
14
−10
40
−40
:

Answer £ 2.56 ✓ 0

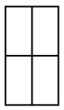
Turn over for the next question

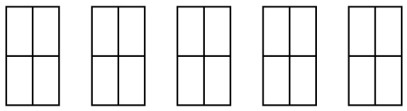
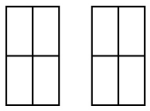
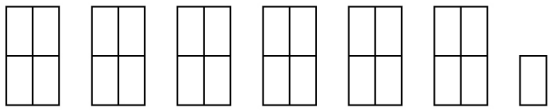
5

Do not write outside the box

5 A company sells three types of bottle.

The pictogram shows how many bottles they sold one week.

Key:  represents 20 bottles

Plastic	
Glass	
Steel	

20 x 5 = 100

20 x 2 = 40 ✓1

(20 x 6) + (5)

= 120 + 5

= 125

5 (a) The company sold **more** plastic bottles than glass bottles that week.

How many more?

[2 marks]

100 - 40 = 60

Answer 60 ✓1

5 (b) The company sells each **steel** bottle for £17.50

Work out the total amount of money made from selling **steel** bottles that week.

[3 marks]

Total bottle sold = (20 x 6) + 5

= 120 + 5 = 125 ✓1

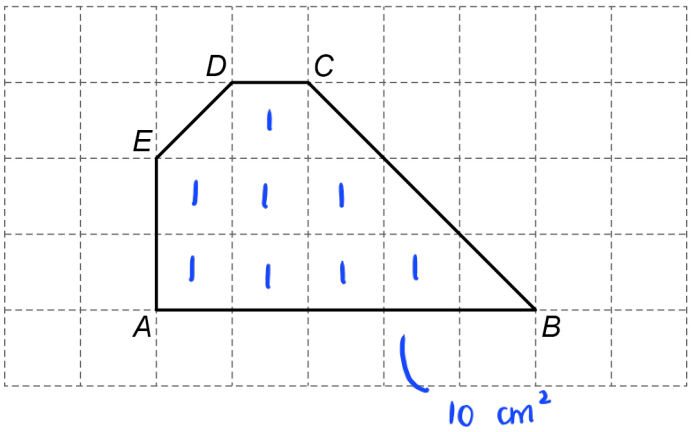
= 125 x 17.50 ✓1

= 2187.50 ✓1

Answer £ 2187.50

Do not write outside the box

6 Shape *ABCDE* is drawn on a centimetre grid.



6 (a) Complete this statement.

[1 mark]

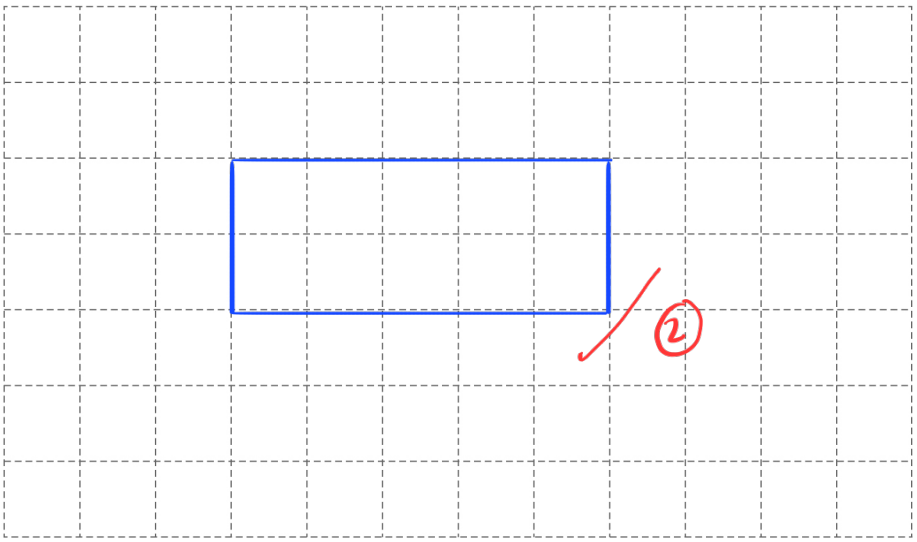
AB : CD = 5 : 1

1

6 (b) On this centimetre grid,

draw a **rectangle** with the same area as shape *ABCDE*.

[2 marks]



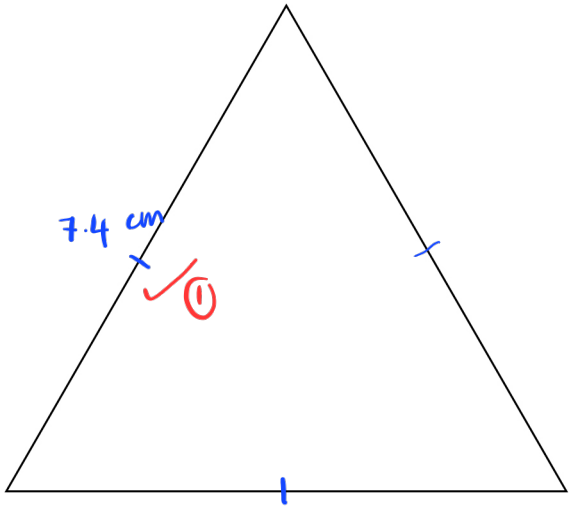
2

8

Do not write outside the box

7 Use a ruler for this question.

Here is an **accurate** drawing of an equilateral triangle.



By measuring, work out the perimeter of the triangle.

State the units of your answer.

[3 marks]

7.4 cm x 3 = 22.2 cm

✓1 ✓1

Answer 22.2 cm

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8 There are 56 cubes in a box.

The cubes are green, red, blue or white.

17 cubes are green.

There are an **equal** number of red, blue and white cubes.

8 (a) How many red cubes are in the box?

[2 marks]

red + blue + white = 56 − 17 = 39 ✓1

red cubes = 39 ÷ 3 = 13

Answer 13 ✓1

8 (b) 24 **more** cubes are added to the box.

A cube is picked at random.

The probability that the cube is green is 0.4

How many of the 24 cubes added to the box are green?

[3 marks]

Total cubes : 56 + 24 = 80 ✓1

number of green cubes = 0.4 × 80

= 32 ✓1

Newly added green cubes = 32 − 17

= 15 ✓1

Answer 15

8

Do not write outside the box

9 An electric car uses 1 unit of electricity to travel 3 miles.

1 unit of electricity costs 50 pence.

Work out the cost of electricity, in pounds, to travel 270 miles.

[3 marks]

Unit of electricity used : $\frac{270 \text{ miles}}{3 \text{ miles}} = 90$ ✓1

Total costs : 90 × 50 pence ✓1

= £45

Answer £ 45 ✓1

Do not write outside the box

10 (a) Leema buys 2 metres of linen at £8.50 per metre.

She also buys 5 metres of cotton.

The **total** cost is £38

What is the cost of **one** metre of cotton?

[4 marks]

Cost of linen : 2 x £8.50 = £17 ✓(1)

Cost of 5 metres of cotton : £38 − £17 ✓(1)

= £21

Cost of 1 metre of cotton : £21 ÷ 5 ✓(1)

= £4.20

Answer £ 4.20 ✓(1)

10 (b) Buttons cost 65p each.

The greatest number of buttons Leema can buy with £5 is 7

She says,

"The greatest number of buttons I can buy with £10 is 14 because £10 is double £5"

Is she correct?

Tick a box.

Yes ☐ No ☑

Show working to support your answer.

[2 marks]

£0.65 x 14 = £9.10 ✓(1)

£0.65 x 15 = £9.75

The highest number of buttons she can buy is 15 ✓(1)

9

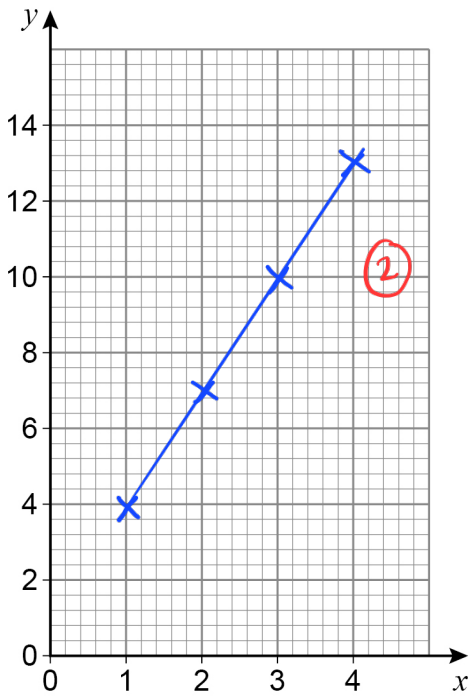
Do not write outside the box

11 Here is a table of values for the equation $y = 3x + 1$

x	1	2	3	4
y	4	7	10	13

11 (a) Draw the graph of $y = 3x + 1$ for values of x from 1 to 4

[2 marks]



11 (b) Work out the value of y when $x = 2.5$

[2 marks]

$y = 3(2.5) + 1 = 8.5$ ✓1 ✓1

$y =$ 8.5

Do not write outside the box

12 A code has five **different** digits written in order, starting with the smallest.

The last digit is the **only** square number.

The middle digit is the **only** even number.

Work out the code.

[3 marks]

Answer 3 5 6 7 9

✓ ✓ (3)

13 Four numbers have a mean of 10

Three of the numbers are 5 8 9

Work out the other number.

[3 marks]

let the 4th numbers be x.

$10 = \frac{5+8+9+x}{4}$ ✓(1)

$40 = 22 + x$ ✓(1)

$x = 18$

Answer 18 ✓(1)

10

Do not write outside the box

14 (a) Rearrange $d = h - 4$ to make h the subject.

[1 mark]

$h = d + 4$

$h =$ d + 4 /1

14 (b) Rearrange $p = \frac{w}{3}$ to make w the subject.

[1 mark]

$w = 3p$

$w =$ 3p /1

15 A linear sequence begins

+3 +3 +3

2 5 8 11

Work out an expression for the nth term.

[2 marks]

$T_n = 2 + (n-1)3$

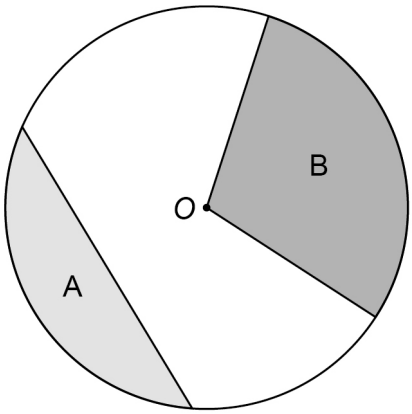
$= 2 + 3n - 3$

$= -1 + 3n$

Answer $T_n = -1 + 3n$ /2

Do not write outside the box

16 The diagram shows a circle, centre *O*, and three straight lines.



Use **one** word to describe each shaded region.

Choose from

arc	chord	sector	segment	tangent

[2 marks]

Region A Segment ✓ 1

Region B Sector ✓ 1

17 Work out $\begin{pmatrix} 1 \\ 2 \end{pmatrix} + \begin{pmatrix} 4 \\ 6 \end{pmatrix}$ $= \begin{bmatrix} 1+4 \\ 2+6 \end{bmatrix}$

$= \begin{bmatrix} 5 \\ 8 \end{bmatrix}$

[1 mark]

Answer $\begin{pmatrix} 5 \\ 8 \end{pmatrix}$ ✓ 1

7

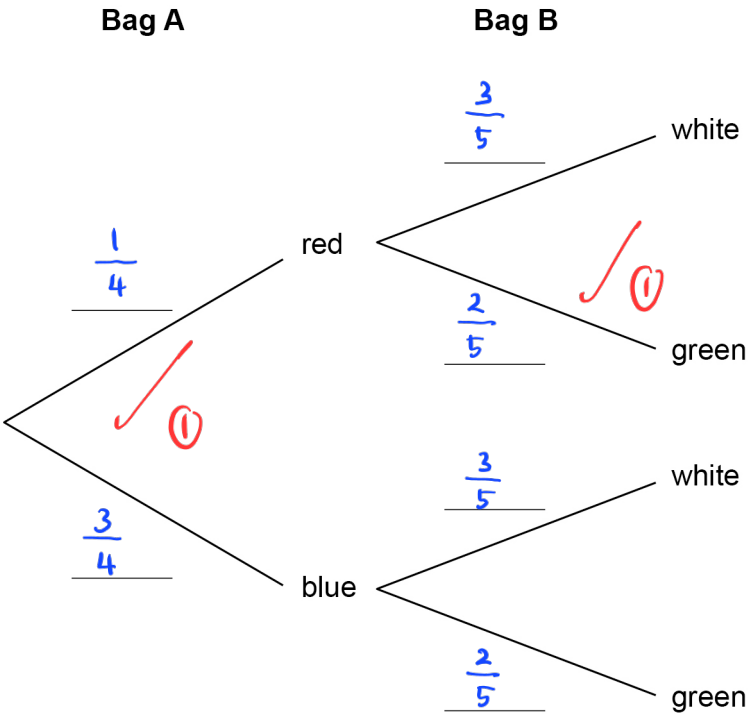
Do not write outside the box

18 Bag A and bag B contain counters.

Bag A	**Bag B**
$\frac{1}{4}$ are red The rest are blue	3 are white 2 are green

18 (a) Complete the tree diagram.

[2 marks]



18 (b) One counter is taken at random from each bag.

Work out the probability that one is red and one is white.

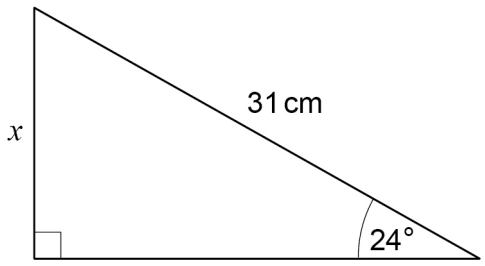
[2 marks]

$\frac{1}{4} \times \frac{3}{5} = \frac{3}{20}$

Answer $\frac{3}{20}$

Do not write outside the box

19



Use trigonometry to work out the value of x.

[3 marks]

$\sin 24^\circ = \frac{x}{31}$ ✓①

$x = 31 \sin 24^\circ$ ✓①

$= 12.6$ cm ✓①

$x =$ 12.6 cm

20 The mass of an iceberg is 2 200 000 kg

This value is a 12% reduction from the **original** mass of the iceberg.

Work out the **original** mass of the iceberg.

Give your answer in standard form.

[3 marks]

88% of original mass = 2 200000 kg ✓①

original mass = $2\,200\,000 \text{ kg} \times \frac{100}{88}$ ✓①

$= 2\,500\,000$ kg

$= 2.5 \times 10^6$ kg ✓①

Answer 2.5×10^6 kg

10

Do not write outside the box

21 A chef has a tub of blueberries.

She wants to

use all the blueberries

put the same number of blueberries on each dessert.

$$D = \frac{k}{b}$$

D is the number of desserts.

b is the number of blueberries on each dessert.

21 (a) What does the constant k represent?

Tick the correct box.

[1 mark]

- [✓] The number of blueberries in the tub ✓ 1
- [ ] The number of desserts
- [ ] The number of blueberries on each dessert
- [ ] None of the above

21 (b) Complete the table.

[2 marks]

b	2	6	8 ✓1
D	120	40 ✓1	30

$120 = \frac{k}{2}$ $\quad k = 240$

$D = \frac{240}{6}$ $\quad = 40$

$30 = \frac{240}{b}$ $\quad b = 8$

Do not write outside the box

22 (a) A fair spinner has six equal sections, each with the number 5, 6, 7 or 8

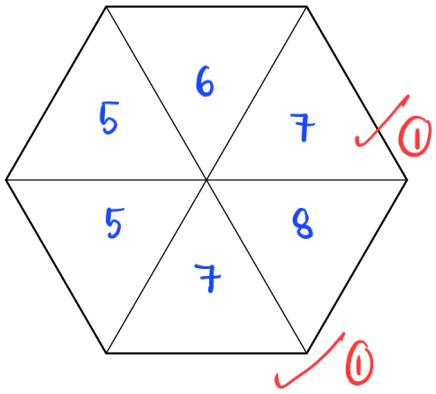
Each number appears at least once.

P(even number) = P(7) — there are two even numbers (6 and 8) there should be two 7 also.

Work out P(5) Hence, the last number should be 5.

You may use the blank spinner to help you.

[3 marks]



Answer $\frac{2}{6}$ ✓ (1)

22 (b) A different spinner has ten sections, each labelled A, B, C or D.

	A	B	C	D
Probability	0.1	0.5	0.2	0.3

Give **one** reason why there **must** be a mistake in the table.

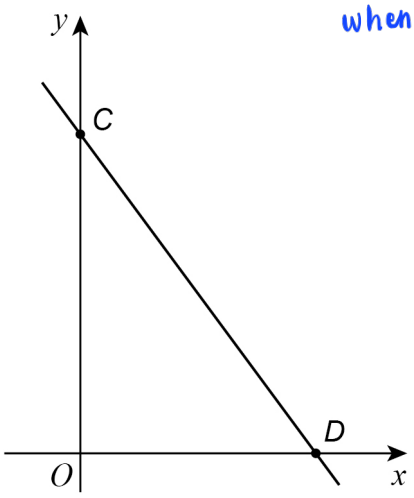
[1 mark]

The total probability adds up to 1.1. ✓ (1)

7

Do not write outside the box

23 (a) Here is a sketch of the graph $y = -2x + 6$



when $x = 0$, $y = 6$

$y = 0$, $x = 3$

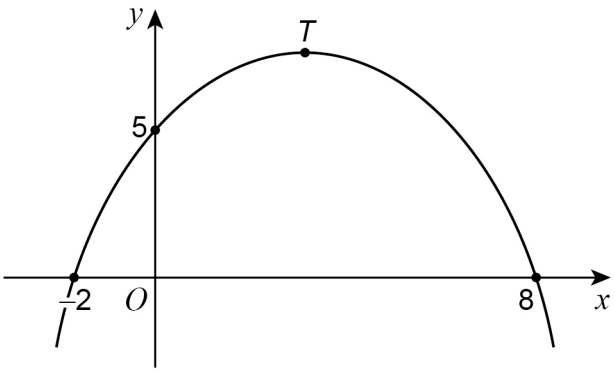
Complete the coordinates of *C* and *D*.

[2 marks]

C (0 , 6) ✓1

D (3 , 0) ✓1

23 (b) Here is a sketch of a quadratic graph.



Complete the following statements.

[2 marks]

The value of the ***y*-intercept** is 5 ✓1

The ***x*-coordinate** of the turning point, *T*, is 3 ✓1

Do not write outside the box

24 Archie flips a biased coin 200 times.

Here is some information about the outcomes after each 50 flips.

Total number of flips	50	100	150	200
Number of heads	10	27	37	52

Work out the best estimate for the probability of flipping a head.

Give a reason for your answer.

[2 marks]

Answer $\frac{52}{200}$ ✓1

Reason largest number of flips give the best estimation ✓1

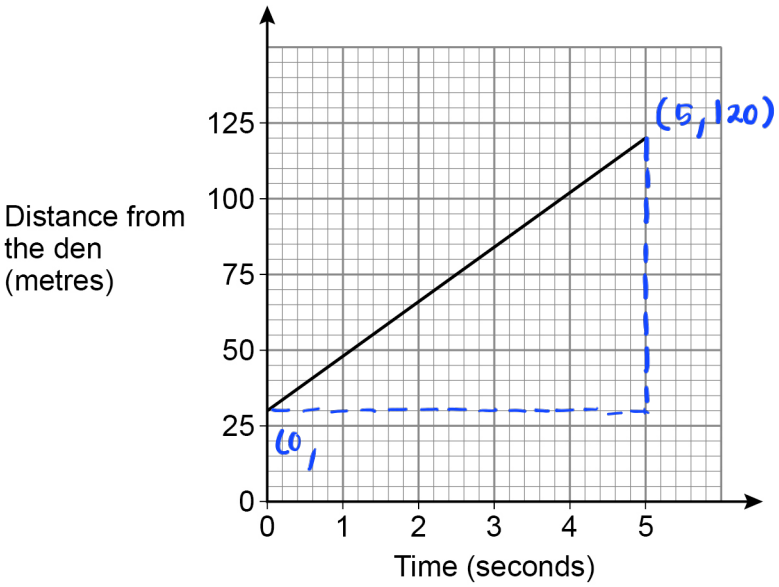
Turn over for the next question

6

Do not write outside the box

25 A lion is sprinting in a straight line away from its den.

The graph shows the lion's distance from the den.



Work out the speed of the lion in metres per second.

[3 marks]

Speed = distance / time

= (120 − 30) / 5 ✓0

= 90 / 5 ✓0

= 18 ms^{-1} ✓0

Answer 18 m/s

END OF QUESTIONS

3

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