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

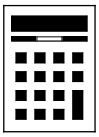
F

Foundation Tier Paper 3 Calculator

Monday 10 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.

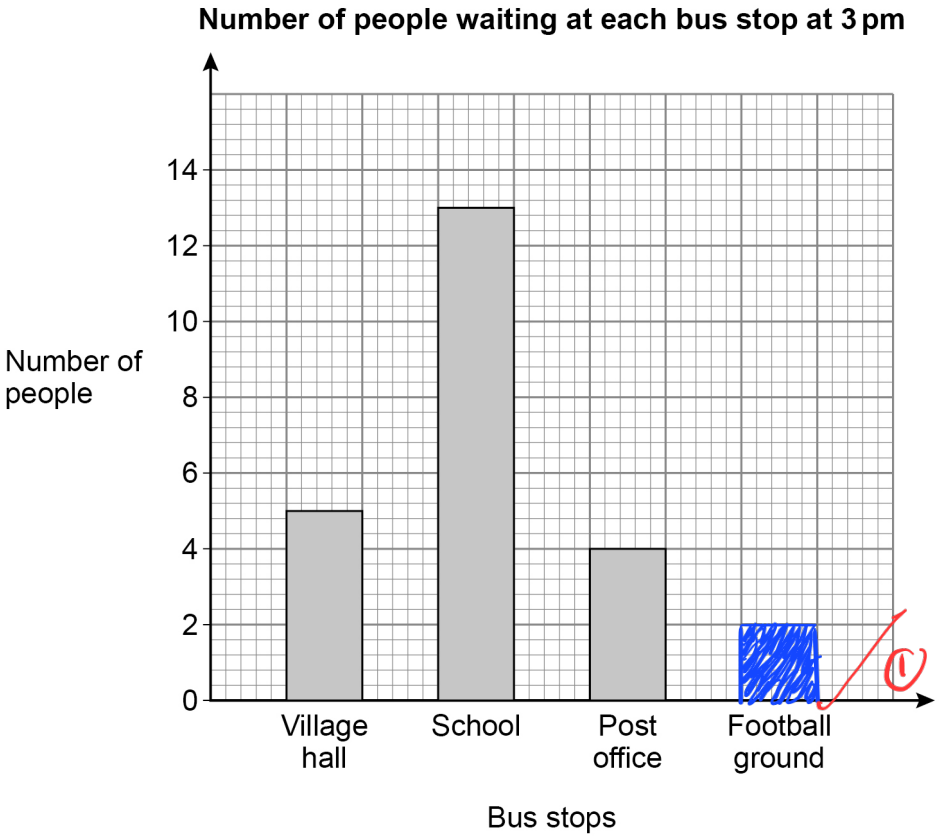
For Examiner's Use	
Pages	Mark
2–3	
4–5	
6–7	
8–9	
10–11	
12–13	
14–15	
16–17	
18–19	
20–21	
22–23	
24	
TOTAL	

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

Do not write outside the box

1 A village has four bus stops.

The bar chart shows information about the people at the bus stops at **3 pm** one day.



1 (a) Two people were at the Football ground bus stop.

Show this information on the bar chart.

[1 mark]

1 (b) How many **more** people were at the School bus stop than at the Post office bus stop?

[1 mark]

13 − 4 = 9

Answer 9

Do not write outside the box

2 Here are four temperatures in degrees C

–5	3	–7	–1

Write the temperatures in order, starting with the **coldest**.

[2 marks]

Answer -7 -5 -1 3 2

3 Here are the first three terms of a linear sequence.

+6 +6 +6

5 11 17 23

3 (a) Write down the next term.

[1 mark]

Next term 23 1

3 (b) Describe the term-to-term rule.

[1 mark]

Term-to-term rule +6 1

6

Do not write outside the box

4 Luca spends 71p

He pays the exact amount with 4 coins.

List the coins he uses.

[2 marks]

Answer 50p 10p 10p 1p ✓2

5 Complete each statement using **one** of these symbols.

$<$ $=$ $>$

[3 marks]

2.54 $>$ 2.508 ✓1

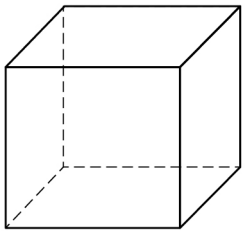
0.25 $=$ $\frac{1}{4}$ ✓1

2 $<$ $\frac{5}{2}$ ✓1

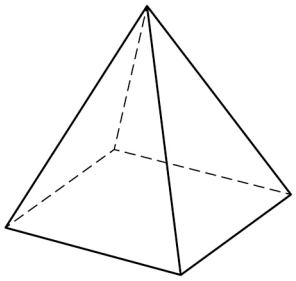
Do not write outside the box

6 Here are three solids.

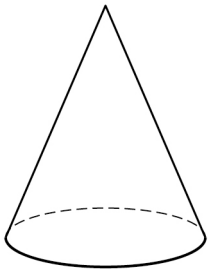
Cube



Square-based pyramid



Cone



6 (a) How many **faces** does the cube have?

[1 mark]

Answer 6 ✓ 1

6 (b) How many **edges** does the square-based pyramid have?

[1 mark]

Answer 8 ✓ 1

6 (c) How many **vertices** does the cone have?

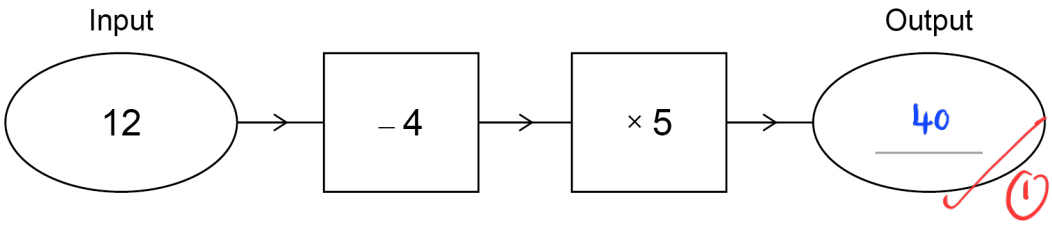
[1 mark]

Answer 1 ✓ 1

8

Do not write outside the box

7 (a) Here is a number machine.



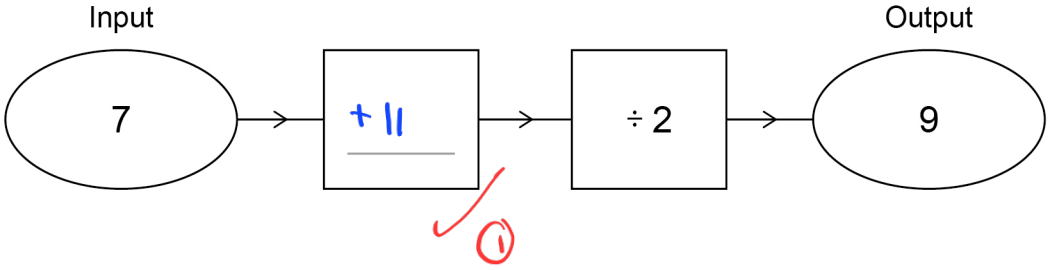
Complete the number machine.

[1 mark]

(12 − 4) × 5

= 8 × 5 = 40

7 (b) Here is a different number machine.

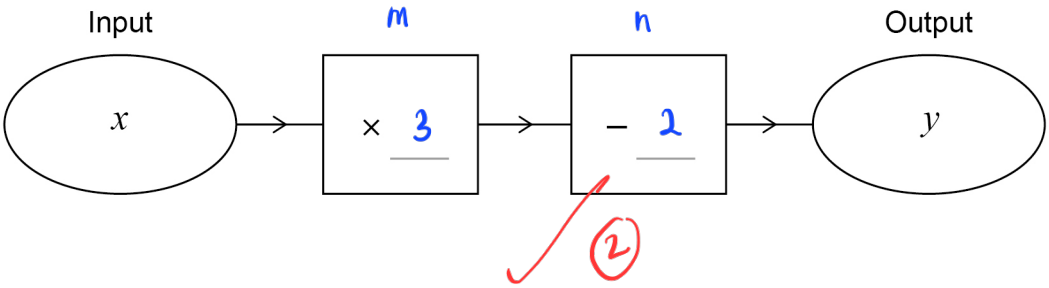


Complete the number machine.

[1 mark]

Do not write outside the box

7 (c) Here is a different number machine.



2

When $x = 5$ $y = 13$

and

when $x = 10$ $y = 28$

Complete the number machine.

[2 marks]

$5m - n = 13$ —① $10m - n = 28$ — ②

② − ① : $10m - 5m = 28 - 13$

$5m = 15$

$m = 3$ $n = 5(3) - 13 = 2$

Turn over for the next question

4

Do not write outside the box

8

- A pack of pegs costs 40p
- A bar of soap costs £2.20
- A basket costs £7

Dan buys **two** packs of pegs, **one** bar of soap and **one** basket.

What fraction of the total cost is the cost of the basket?

[3 marks]

Total cost : $2(£0.40) + £2.20 + £7$ ✓1

$= £0.80 + £2.20 + £7$ ✓1

$= £10$

Fraction of basket's price to total price :

$\frac{7}{10}$

Answer $\frac{7}{10}$ ✓1

9 Calculate $\sqrt{625} + 7^3$

[2 marks]

$\sqrt{625} = 25$, $7^3 = 343$

$25 + 343 = 368$

Answer 368 ✓2

Do not write outside the box

10 8400 fans go to a rugby match.

6850 of the fans support the **Home** team.

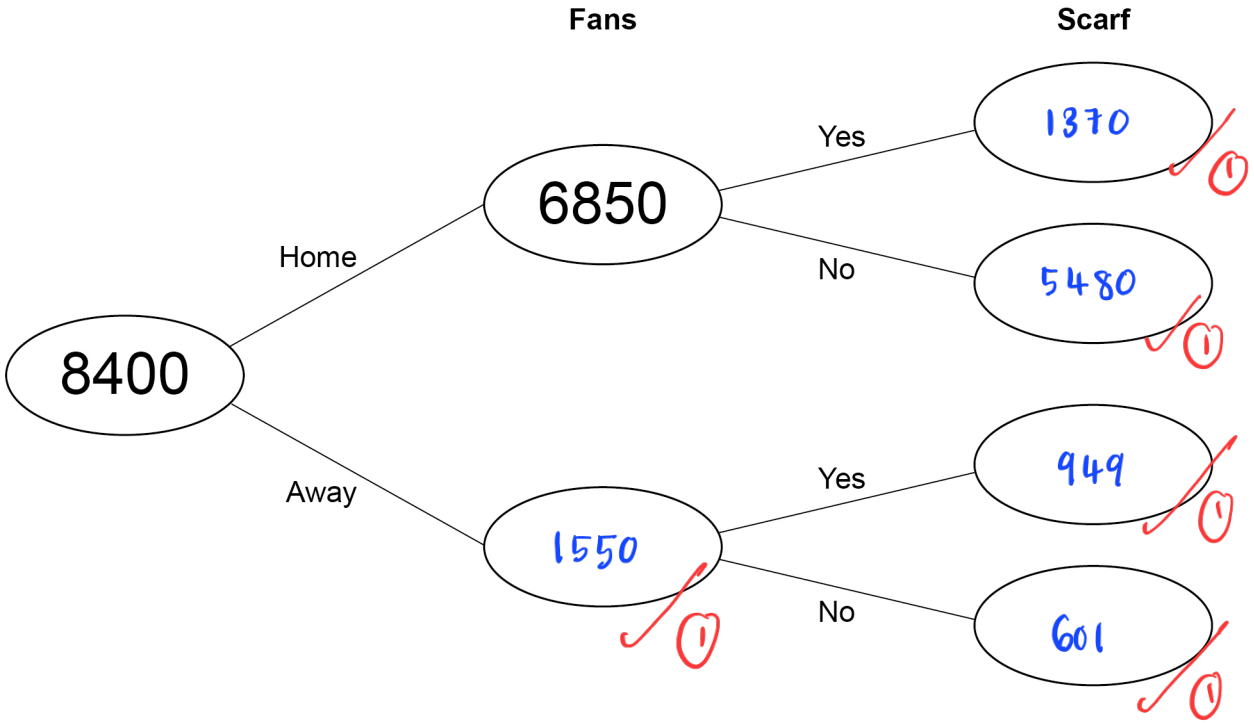
The remaining fans support the **Away** team.

20% of the **Home** fans wear a scarf.

2319 of all the fans wear a scarf.

Complete the frequency tree.

[5 marks]

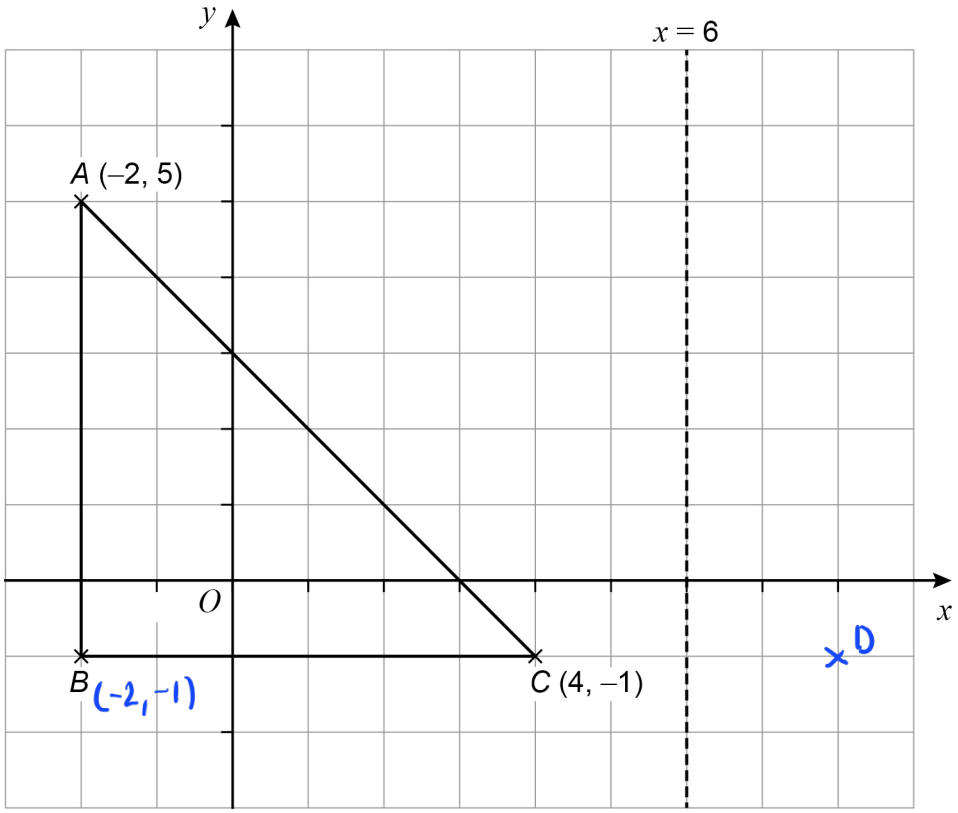


Turn over for the next question

10

Do not write outside the box

11



11 (a) Work out the coordinates of *B*.

[1 mark]

Answer (-2 , -1)

1

11 (b) Point *C* is reflected in the line $x = 6$ to point *D*.

Work out the coordinates of *D*.

[1 mark]

Answer (8 , -1)

1

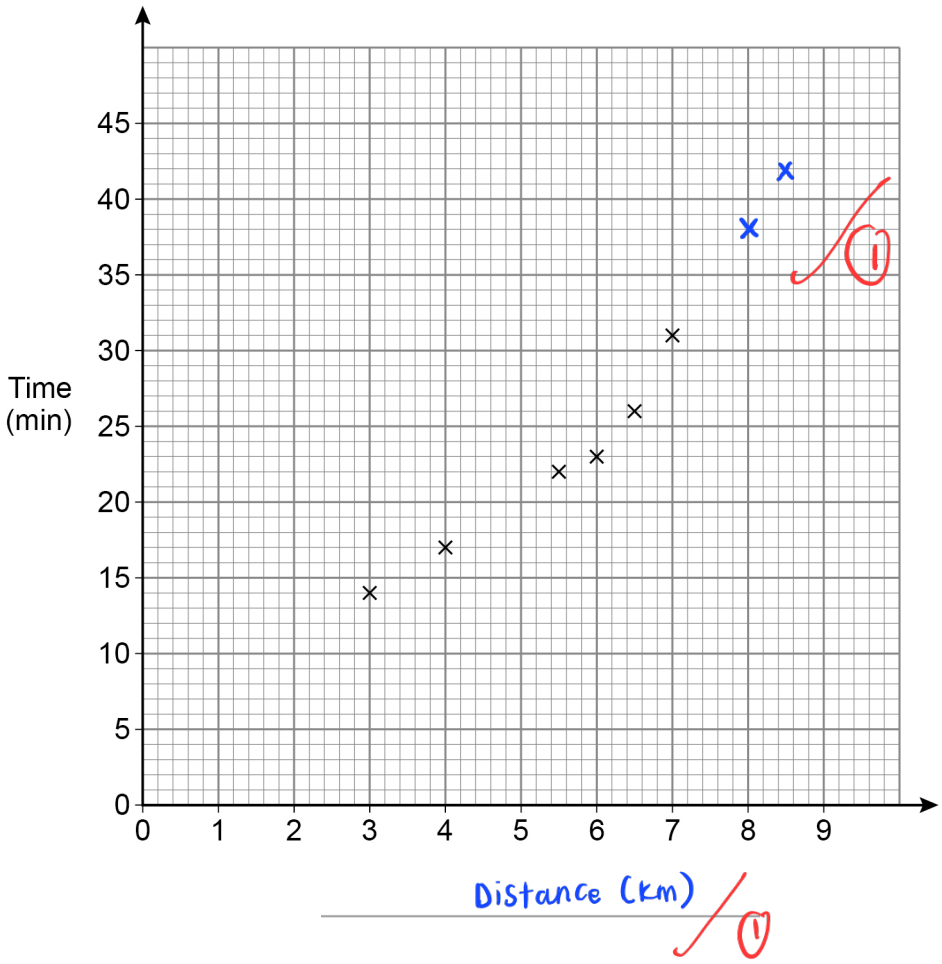
Do not write outside the box

12 Liz records the distance of some runs and the time each run takes.

Distance (km)	3	4	5.5	6	6.5	7	8	8.5
Time (min)	14	17	22	23	26	31	38	42

The scatter graph shows **some** of the information from the table.

Running distances and time taken



12 (a) Complete the graph by adding the missing **label** and plotting the **two** missing points.

[2 marks]

12 (b) Describe the correlation shown in the scatter graph.

[2 marks]

Type of correlation Positive

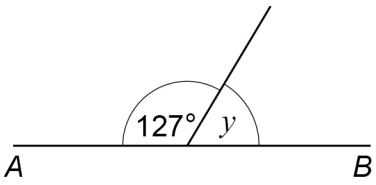
Strength of correlation Strong

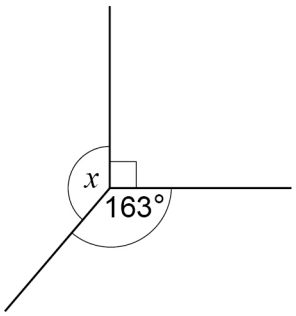
6

Do not write outside the box

13 *AB* is a straight line.

Not drawn accurately





Is y half of x ?

Tick a box.

Yes ☐ No ☑

Show working to support your answer.

[3 marks]

$y = 180^\circ - 127^\circ = 53^\circ$ ✓1

$x = 360^\circ - 90^\circ - 163^\circ$

$= 107^\circ$ ✓1

$\frac{x}{2} = \frac{107^\circ}{2} = 53.5^\circ$. y is not half of x .

✓1

Do not write outside the box

14 Multiply out $3(2x + 8)$

[2 marks]

6x + 24

Answer 6x + 24 ✓2

15 Complete these statements.

[3 marks]

4x ✓1 + $5x$ = $9x$

y × y ✓1 = y^2

3t ✓1 − $2t$ = t

Turn over for the next question

8

Do not write outside the box

16 Tins of beans are sold in shop A and shop B.

Shop A	**Shop B**
1 tin 64p	1 tin 62p
Buy 4 tins for the price of 3 tins	Pack of 3 tins £1.70
	10% reduction in price on all **packs**

At which shop is it cheaper to buy 20 tins?

State how much cheaper.

[5 marks]

Shop A : 5 sets of 4 tins

$5 \times (3 \times 64p)$

$= 5 \times £1.92$

$= £9.60$ (1)

Shop B : 6 sets of pack of 3 tins and 2 sets of 1 tin

$6 \times (0.9 \times £1.70) + 2 (62p)$ (1)

$= £9.18 + £1.24$ (1)

$= £10.42$ (1)

$£10.42 - £9.60 = £0.82$

Shop A Cheaper by £0.82 (1)

Do not write outside the box

17 (a) There are 30 students in a class.

12 of the students have school lunch.

Work out the ratio

students having school lunch : students not having school lunch

Give your answer in its simplest form.

[2 marks]

students not having lunch : $30 - 12 = 18$

ratio of lunch : no lunch $= 12 : 18$ ✓1

$= 2 : 3$

Answer 2 : 3 ✓1

17 (b) In a different class

students wearing glasses : students not wearing glasses = 3 : 8

What fraction of students in this class wear glasses?

[1 mark]

Total ratio : $3 + 8 = 11$

Answer $\frac{3}{11}$ ✓1

17 (c) The ratio 4 : 9 is written in the form $1 : n$

Work out the value of n.

[1 mark]

$4 : 9$

$\div 4$ ( ) $\div 4$

$1 : \frac{9}{4}$

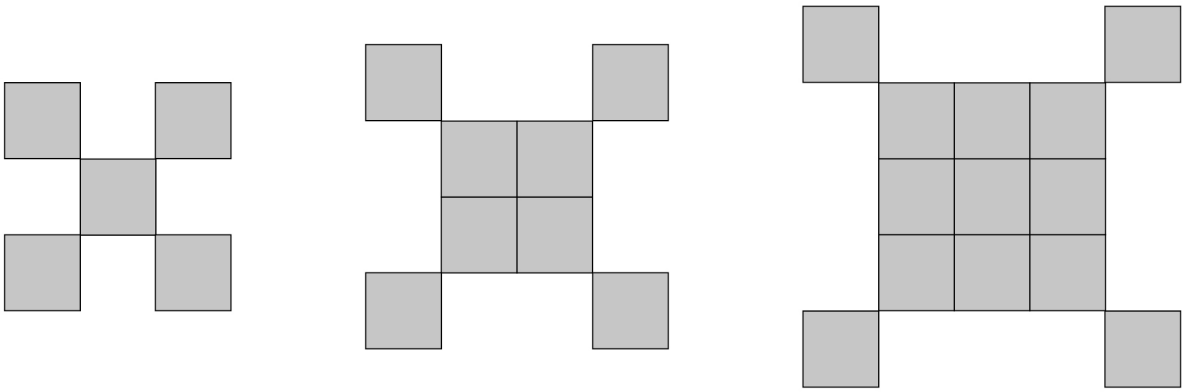
$n = \frac{9}{4}$ ✓1

9

Turn over ►

Do not write outside the box

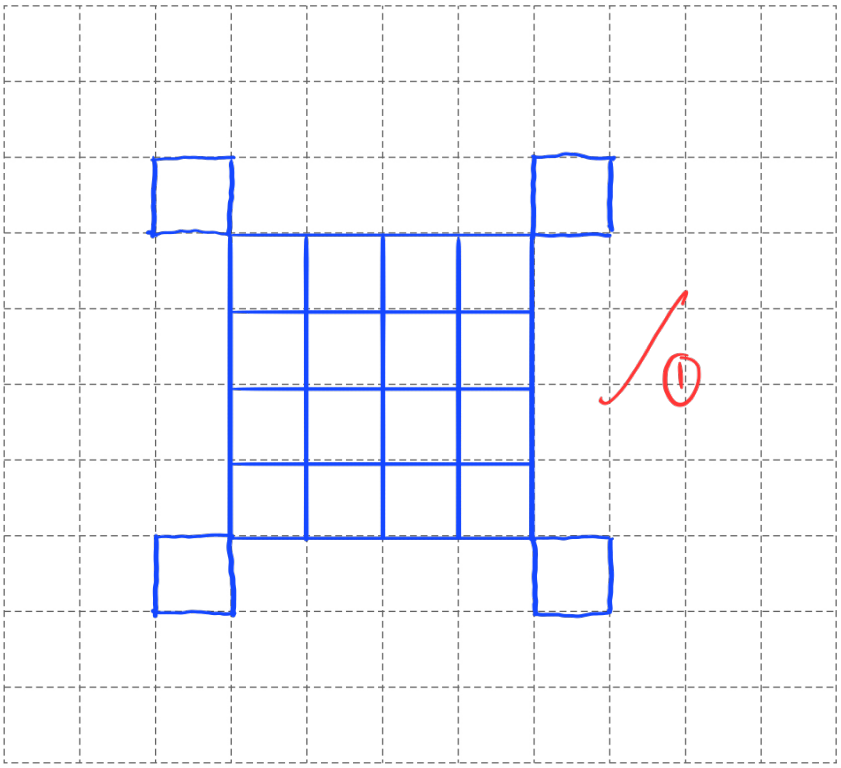
18 Here are the first three Patterns in a sequence made up of small squares.



Pattern 1 Pattern 2 Pattern 3

18 (a) On the grid, draw Pattern 4

[1 mark]



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18 (b) The expression for the number of small squares in Pattern n is $n^2 + 4$

Work out the least value of n for which the number of small squares is greater than 500

[1 mark]

$n^2 + 4 > 500$

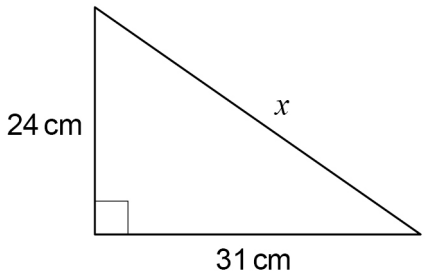
$n^2 > 496$

$n > 22.3...$

$n = 23$ (smallest integer after 22.3...)

$n =$ 23 ✓1

19



Not drawn accurately

Use Pythagoras' theorem to work out the value of x.

Give your answer as a decimal.

[3 marks]

$x^2 = 24^2 + 31^2$ ✓1

$x = \sqrt{24^2 + 31^2}$ ✓1

$= \sqrt{1537}$

$= 39.2$ ✓1

Answer 39.2 cm

5

Do not write outside the box

20 Rick claims most of the flats in his 8-floor building are energy efficient.

He samples 45 flats from floors 1 to 5

Give a reason why this sample may **not** be useful in testing Rick's claim.

[1 mark]

The data only consists 5 out of 8 floors ✓1

21 $3(x-1) \equiv 3x-3$ is an identity.

Tick **one** box.

[1 mark]

- [✓] It is true for **all** values of x ✓1
- [ ] It is true for **some** values of x
- [ ] It is true for **no** values of x

Do not write outside the box

22 Kay hires a digger.

The cost per day is

- £24.50 for the first 5 days
- reduced by 20% for day 6
- the same as day 6 for day 7 onwards.

The **total** cost is £259.70

For how many days did Kay hire the digger?

You **must** show your working.

[5 marks]

$\frac{80}{100} \times £24.50 = £19.60$ ✓(1) ✓(1)

$5(24.50) + n(19.60) = 259.70$

$122.50 + 19.60n = 259.70$ ✓(1)

$19.60n = 137.20$

$n = \frac{137.20}{19.60}$ ✓(1)

$= 7$

Klay hires the digger for: $5 + 7$

$= 12$ days ✓(1)

Answer 12

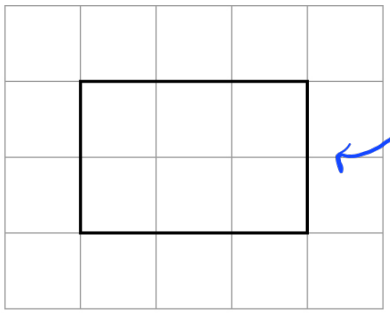
Turn over for the next question

7

Do not write outside the box

23 The front elevation of a cuboid is shown on this centimetre grid.

Front elevation



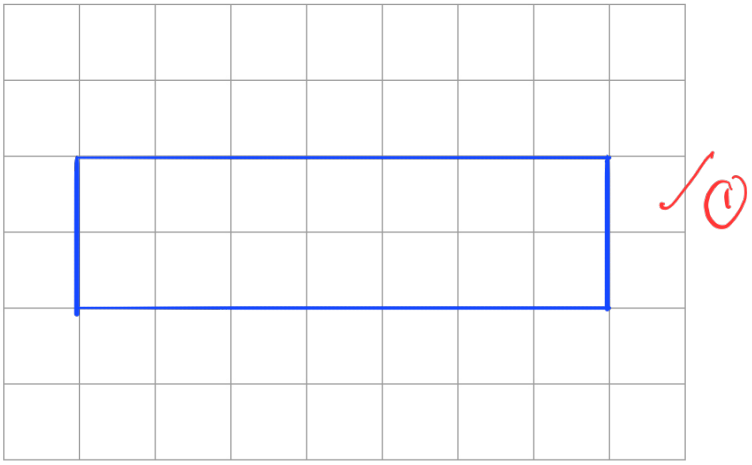
The volume of the cuboid is 42 cm^3

$\frac{42\ cm^3}{6\ cm^2} = 7\ cm$ (width) ✓1

Draw the **side elevation** on this centimetre grid.

[2 marks]

Side elevation



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24 (a) On Monday, Larrs swims 50 metres in 40 **seconds** at a constant speed.

On Tuesday, Larrs swims 1.5 kilometres.

Assume he swims at the same constant speed as on Monday.

How many **minutes** does he swim for on Tuesday?

[5 marks]

Speed $= \frac{50\ m}{40\ s} = 1.25\ ms^{-1}$

Time on Tuesday: $\frac{1500\ m}{t} = 1.25\ ms^{-1}$ ✓1

$t = \frac{1500}{1.25} = 1200\ s$ 2

$= 1200\ s \times \frac{1\ min}{60\ s}$ ✓1

$= 20\ min$

Answer 20 ✓1 minutes

24 (b) In fact, on Tuesday Larrs swims at a slower constant speed than on Monday.

What does this mean about the number of minutes he swims for on Tuesday?

Tick the correct box.

[1 mark]

- ☐ It is less than the answer to part (a)
- ☐ It is the same as the answer to part (a)
- ☑ ✓1 It is greater than the answer to part (a)
- ☐ It is not possible to say

8

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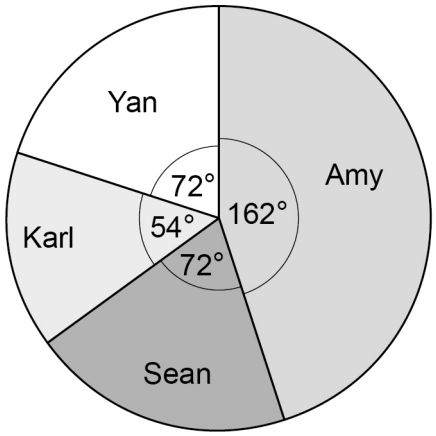
25 Four people are taking part in a television talent show.

Here are Amy's marks from the 6 judges.

8	9	9	6	9	10

The pie chart represents the phone vote.



Amy's total score is found by

4 × the **mean** of her marks

+

her **percentage** of the phone vote

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Work out Amy's total score.

[4 marks]

mean of marks = $\frac{8+9+9+6+9+10}{6} = 8.5$ ✓1

Percentage of phone vote = $\frac{162^\circ}{360^\circ} \times 100\% = 45\%$ ✓1

Total score = $(4 \times 8.5) + 45$ ✓1

= 79 ✓1

Answer 79

Turn over for the next question

4

Do not write outside the box

26 House prices on a street increase by 5.1% each year.

Show that after 14 years the house prices on the street will be at least double.

[2 marks]

let house price be x.

After 14 years, $x \times (1.051)^{14}$ ✓①

$x \times 2.006\ldots$ ✓①

$= 2x\ldots$

27 Town A has

a population of 84 000

an area of 7 **square miles**.

Town B has a population density of 4695 people per **square kilometre**.

$$\text{Population density} = \frac{\text{population}}{\text{area}}$$

Which town has the greater population density?

Use 1 square mile = 2.6 square kilometres

Tick a box.

Town A ☐ Town B ☑

Show working to support your answer.

[3 marks]

Town A area = 7×2.6 square km

$= 18.2$ square km

Town A population density = $\frac{84000}{18.2} = 4615$ people per square km ✓②

∴ Town B has greater population density ✓①

END OF QUESTIONS

5

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ANSWER IN THE SPACES PROVIDED

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