Please write clearly in block capitals.

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

Surname _____

Forename(s) _____

Candidate signature _____

I declare this is my own work.

GCSE MATHEMATICS

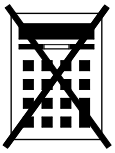
F

Foundation Tier Paper 1 Non-Calculator

Wednesday 6 November 2024 Morning Time allowed: 1 hour 30 minutes

Materials

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



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.
- 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	
TOTAL	

Please note that these worked solutions have neither been provided nor approved by AQA and may not necessarily constitute the only possible solutions. Please refer to the original mark schemes for full guidance.

Any writing in blue should be written in the exam.

Anything written in green in a rectangle doesn't have to be written in the exam.

If you find any mistakes or have any requests or suggestions, please send an email to curtis@cgmaths.co.uk

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

Do not write outside the box

1 (a) Write down the value of $\sqrt{49}$

[1 mark]

Answer 7

$7^2 = 7 \times 7 = 49$. So the square root of 49 is 7 as this is the positive number which is squared to give 49

1 (b) Work out the value of 3^3

[1 mark]

Answer 27

$3^3 = 3 \times 3 \times 3 = 9 \times 3 = 27$

1 (c) Write 10 000 as a power of 10

[1 mark]

$10 \times 10 = 100$
$100 \times 10 = 1000$
$1000 \times 10 = 10000$
So $10 \times 10 \times 10 \times 10 = 10^4 = 10000$

Answer 10^4

2 1 pound = 16 ounces

Work out the number of ounces in 3 pounds.

[2 marks]

$$\begin{array}{r} 16 \\ \times\ 3 \\ \hline 48 \\ {\scriptstyle 1} \end{array}$$

1 pound is multiplied by 3 to get 3 pounds. So the 16 ounces must also be multiplied by 3

Answer 48 ounces

Do not write outside the box

3 (a) Write $\frac{3}{2}$ as a mixed number.

[1 mark]

Answer $1\frac{1}{2}$

3 ÷ 2 = 1 with a remainder of 1. So 1 is the whole number and the remainder of 1 is left in the fraction

3 (b) Work out $\frac{1}{5} + \frac{1}{5}$

[1 mark]

Answer $\frac{2}{5}$

As the denominators are the same, the numerators can be added

4 (a) Write down **all** the factors of 20

[2 marks]

Answer 1, 20, 2, 10, 4, 5

Listing the factors in pairs starting with the smallest and largest

4 (b) Mica says,

"When two multiples of 5 are added, the answer is always a multiple of 10"

Give **one** example to show that he is wrong.

[1 mark]

5 + 10 = 15 ← Both 5 and 10 are multiples of 5 and adding these gives 15, which is not a multiple of 10

10

Do not write outside the box

5 Put these values in order of size, starting with the smallest.

80% 0.7 $\frac{3}{4}$

70% 75%

Writing them all as percentages makes them easier to compare. To convert any decimal or fraction into a percentage it can be multiplied by 100

[2 marks]

Answer 0.7 $\frac{3}{4}$ 80%

6 Sally buys two hats and three scarves.

The **total** cost is £28.50

Each hat costs £4.50

Work out the cost of each scarf.

[4 marks]

4.50
× 2
9.00
1

Multiplying the cost of each hat by 2 works out that the cost of the two hats is £9

$\overset{1}{2}\overset{1}{8}.5\,0$
$-\ 9.0\,0$
$1\,9.5\,0$

Subtracting the cost of the two hats from the total cost works out that the cost of the three scarves is £19.50

$0\,6.\,5\,0$
$3\overline{)1\,9.\overset{1}{5}\,0}$

Dividing the cost of the three scarves by 3 works out that each scarf costs £6.50

Answer £ 6.50

Do not write outside the box

7 120 people visit a maze.

80 are children, the rest are adults.

At the start of the maze you can turn left or right.

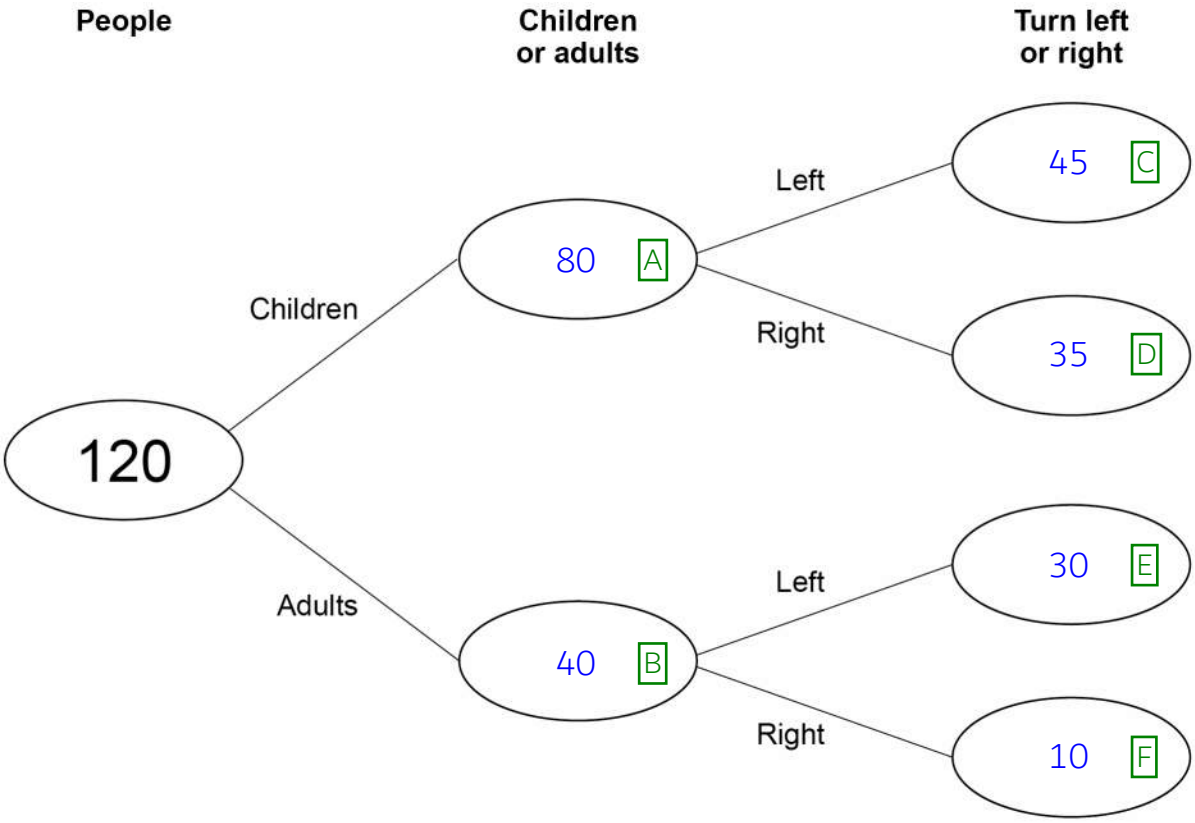
45 children turn left.

75 people in total turn left.

A: 80 are children.
B: 120 - 80 = 40 adults.
C: 45 children turn left.
D: 80 - 45 = 35 children turn right.
E: 75 - 45 = 30 adults turn left.
F: 40 - 30 = 10 adults turn right

7 (a) Complete the frequency tree.

[4 marks]



7 (b) What fraction of the **children** turn left?

Give your answer in its simplest form.

[2 marks]

$\frac{45}{80}$ ← 45 out of the 80 children turn left

$5\overline{)8\ 0}\ 1\ 6$ ← Simplifying the fraction by dividing both the numerator and denominator by 5. 45 ÷ 5 = 9

Answer $\frac{9}{16}$

9 and 16 cannot be divided by the same amount to get smaller whole numbers so it cannot go any simpler

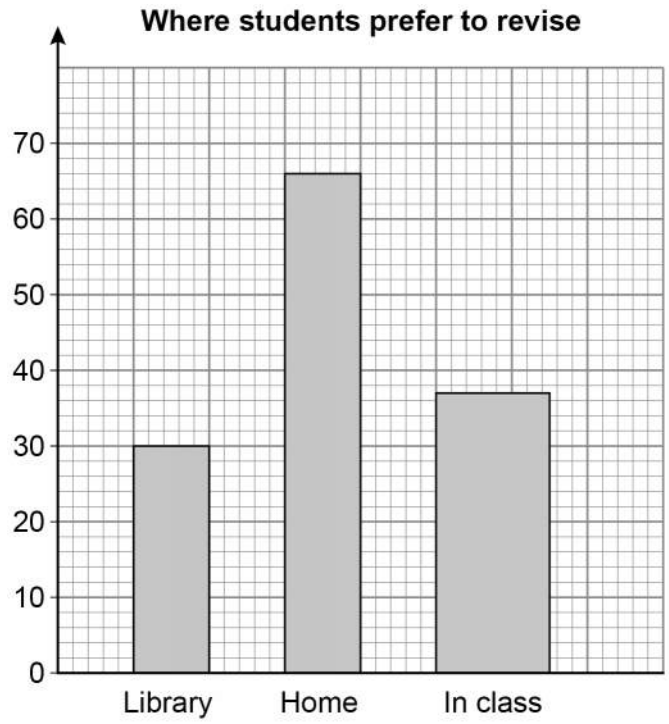
12

Do not write outside the box

8 The table shows information about where students prefer to revise.

Library	Home	In class
30	68	37

Ed draws this bar chart to represent the data.



Write down **three** mistakes he has made.

[3 marks]

Mistake 1 No label on the vertical axis

From the graph it is unclear what the numbers mean

Mistake 2 Bars are not equal width

On a bar chart the bars should all be the same width

Mistake 3 The bar for Home is 66

It should be 68

Do not write outside the box

9 A number is picked at random from the first three positive odd numbers.

A number is picked at random from the first four prime numbers.

The two numbers are **multiplied** to get a score.

9 (a) Complete the table.

[4 marks]

		prime			
	×	**2**	**3**	5	**7**
odd	**1**	2	3	5	7
	3	6	9	15	21
	5	10	15	25	35

9 (b) What is the probability that the score is a square number?

Give your answer as a fraction.

[2 marks]

Answer $\frac{2}{12}$

The scores which are square numbers are 9 and 25. This is 2 out of the 12 possible scores

9

Do not write outside the box

10 (a) Simplify fully $8m + 4 - 2m + 7$

[2 marks]

Answer $6m + 11$

Collecting like terms. 8m - 2m = 6m and 4 + 7 = 11

10 (b) Simplify fully $\frac{1}{2}c \times 6d$

[2 marks]

Answer $3cd$

1/2 × 6 = 3 and writing c and d next to this means that they are multiplied

Do not write outside the box

11

The multipack costs 10% **less than** 6 single bags.

Work out the cost of the multipack.

[4 marks]

55
× 6
330

Multiplying the cost of a single bag by 6 works out that 6 single bags cost 330p

2 12
3 3 10
- 3 3
2 9 7

10% of 330p = 330p ÷ 10 = 33p. Subtracting this 33p from the 330p reduces it by 10% to 297p, which is the cost of the multipack in pence

Answer £ 2.97

There is 100p in £1, so dividing the 297p by 100 converts it to £2.97

8

Turn over ►

Do not write outside the box

12 Write the ratio 6 : 2 in the form n : 1

[1 mark]

Answer 3 : 1

Dividing both sides of the ratio by 2 simplifies it so that 1 is on the right

13 x and y are two **different positive** numbers.

For each statement, tick the correct box.

[2 marks]

	Always true	**Sometimes true**	**Never true**
$x + y$ is positive	✓		
$x - y$ is negative		✓	

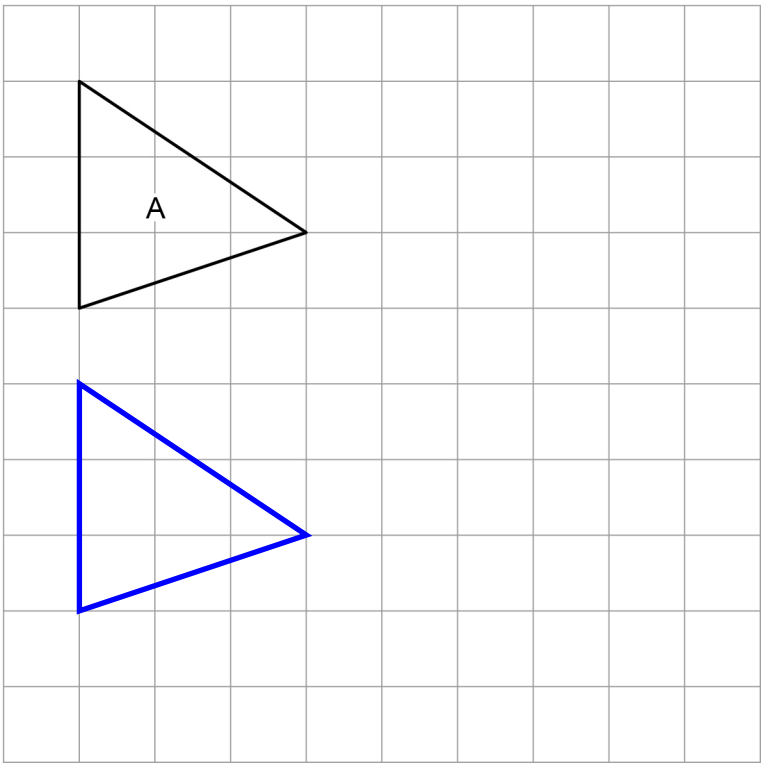
Positive add positive is always positive.

If y is greater than x, subtracting y from x will give a negative.
If y is less than x, subtracting y from x will give a positive

Do not write outside the box

14 (a) On the grid, draw a shape **congruent** to triangle A.

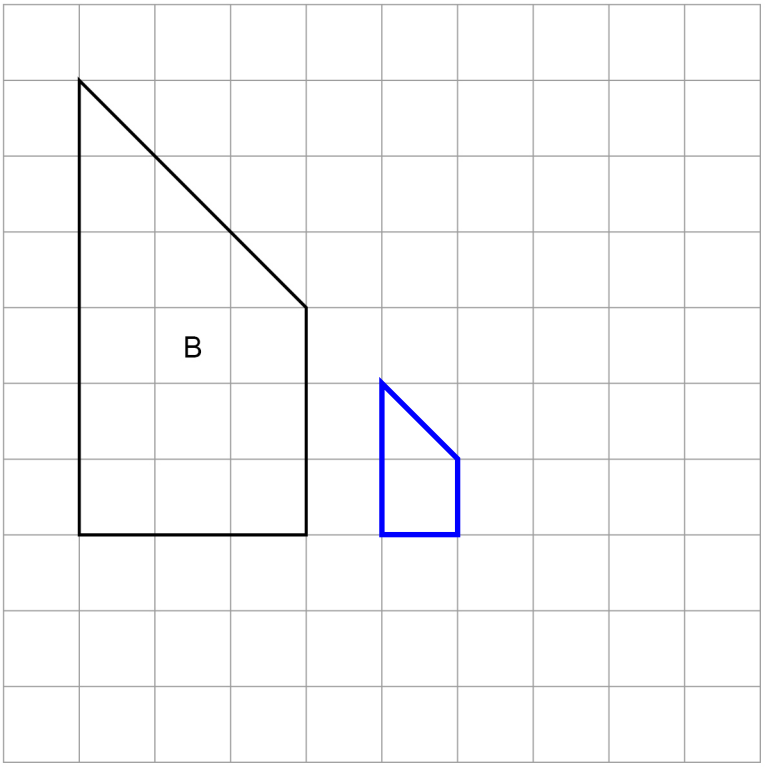
[1 mark]



Congruent means the same shape and size

14 (b) On the grid, **enlarge** shape B by scale factor $\frac{1}{3}$

[2 marks]



Same shape but all the sides are 1/3 of the length

6

Turn over ►

15 35 books are either for adults or for children.

number for adults : number for children = 6 : 1

How many **more** books are for adults than for children?

[3 marks]

35 ÷ 7 ← 6 + 1 = 7 parts in total in the ratio which represent the 35 books. Dividing the 35 books by 7 works out that 1 part of the ratio is worth 5 books

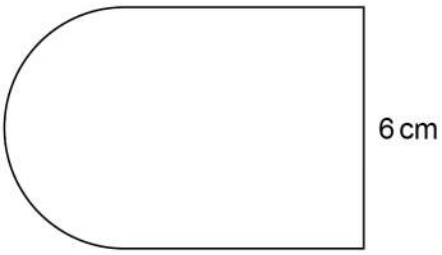
5 × 5 ← 6 - 1 = 5 more parts in the ratio for adults than for children. So multiplying the value of 1 part of the ratio by 5 works out that there are 25 more books for adults than for children

Answer 25

Do not write outside the box

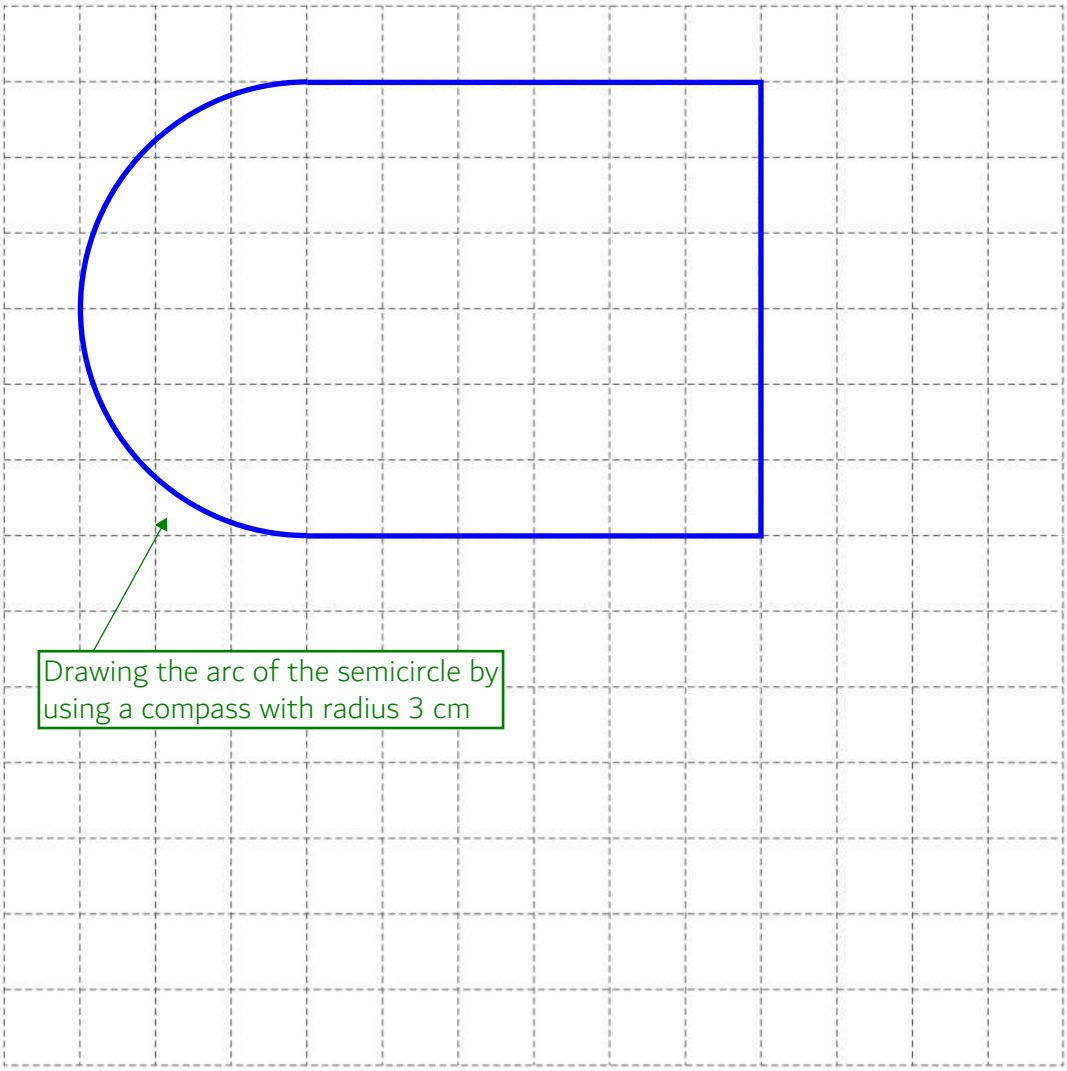
16 This shape is made from a semicircle and a square.

Not drawn accurately



On the centimetre grid below, make an accurate drawing of the shape.

[2 marks]



5

Turn over ►

Do not write outside the box

17 A car travels 4 miles in 5 minutes.

Work out the average speed in miles per hour.

[3 marks]

$4 \div \frac{5}{60}$ ← Miles per hour can be worked out by dividing the distance in miles by the time in hours. There are 60 minutes in an hour so putting the 5 minutes over 60 converts it to hours

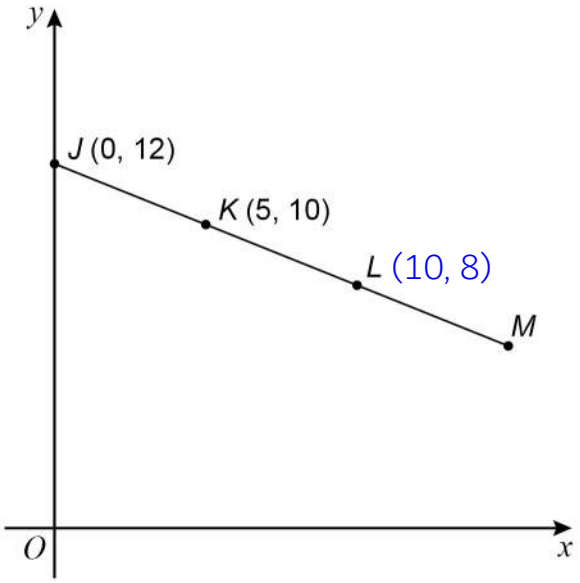
$4 \times \frac{60}{5}$ ← To divide by a fraction: keep the first number, change the division to a multiplication, flip the fraction

$5\overline{)2\,{}^{2}4\,{}^{4}0}$ ← $0\ 4\ 8$ — 4 × 60 = 240 then 240 ÷ 5 = 48

Answer 48 mph

Do not write outside the box

18 *J* (0, 12) and *K* (5, 10) are points on the straight line *JKLM*.



Not drawn accurately

JK = *KL* = *LM* ← This means that each of the points are equally spaced out

Work out the coordinates of *M*.

[3 marks]

From J to K it goes 5 to the right and 2 down. So doing another 5 to the right and 2 down from K finds that the coordinates of L are (10, 8). Then doing another 5 to the right and 2 down from L finds that the coordinates of M are (15, 6)

Answer (15 , 6)

6

Turn over ►

Do not write outside the box

19 Work out the value of 1.5^2

[2 marks]

$$\begin{array}{r} 15 \\ \times\ 15 \\ \hline 75 \\ 150^{2} \\ \hline 225^{1} \end{array}$$

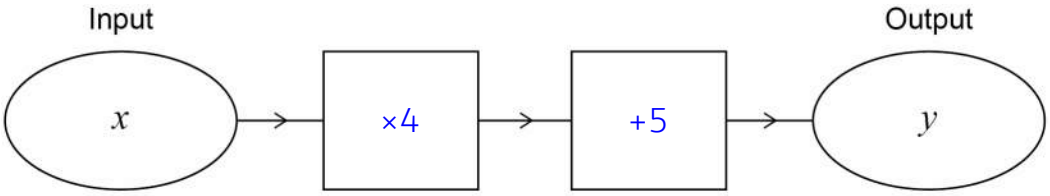
Ignoring the decimal point and doing $15^2 = 15 \times 15$

Answer 2.25

There were 2 decimal places in total in 1.5 and 1.5 so bringing the decimal point back 2 places

20 (a) Complete this number machine so that $y = 4x + 5$

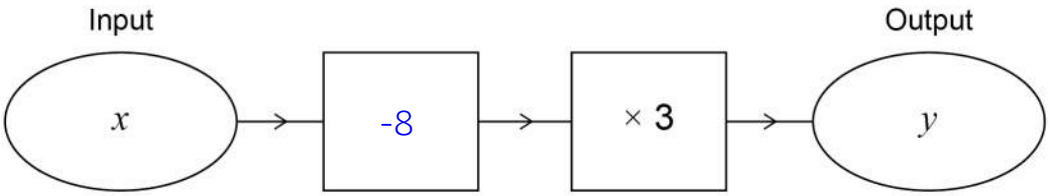
[1 mark]



x is multiplied by 4 then has 5 added to the result to get y

20 (b) Complete this number machine so that $y = 3x - 24$

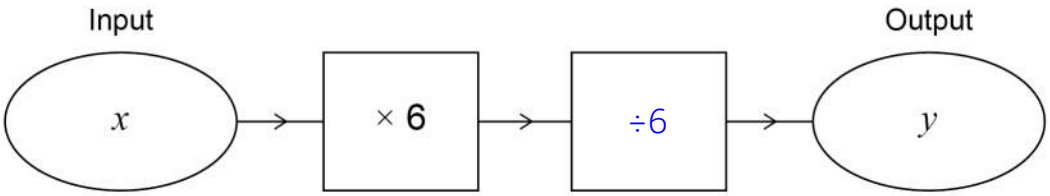
[1 mark]



Going back in the number machine by dividing the 3x - 24 by 3 gives x - 8

20 (c) Complete this number machine so that $y = x$

[1 mark]



Doing the opposite of multiplying by 6 by dividing by 6 cancels each other out so that there is no effect

Do not write outside the box

21 Each number in a list is increased by 10

Tick **one** box for each statement.

[3 marks]

	True	False	Cannot tell
The mode is increased by 10	✓		
The median is increased by 10	✓		
The range is increased by 10		✓	

The mode is the most frequent number. This will be increased by 10.
The median is the middle number when they are all put in order. This will be increased by 10.
Range is the difference between the largest and smallest. As both the largest and smallest increase by 10 there is no effect on the range

22 (a) Write the missing term in the geometric progression.

[1 mark]

16
× 4
64
2

1 4 16 64 256

It multiplies by 4 between each term

22 (b) A Fibonacci-type sequence begins

5 –9

The sequence is continued by adding the previous two terms.

Work out the next **two** terms.

[2 marks]

Answer -4 and -13

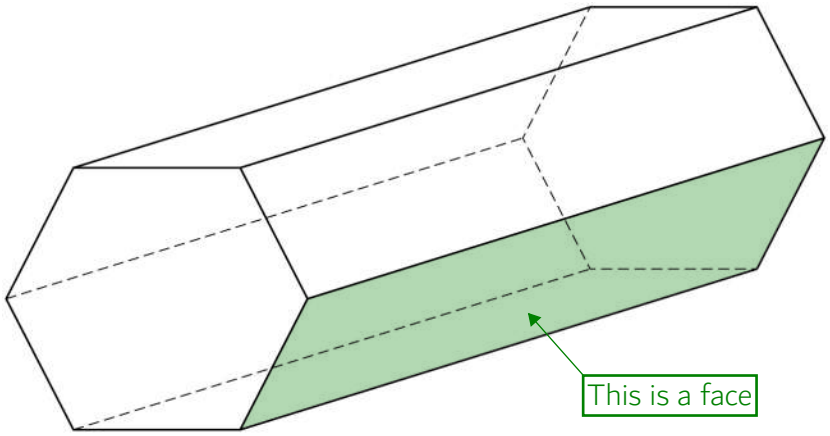
5 + -9 = 5 - 9 = -4

-9 + -4 = -9 - 4 = -13

11

Do not write outside the box

23 Here is a solid prism.



23 (a) How many faces does the prism have?

[1 mark]

Answer 8

23 (b) The prism has

volume = 3500 cm^3

and

length = 20 cm

Work out the area of the cross-section of the prism.

[2 marks]

$$20 \overline{)\, 3\,{}^{3}5^{15}0^{10}0} \;=\; 0\;1\;7\;5$$

Volume of prism = area of cross-section × length. So dividing the volume by the length gives the area of the cross-section

Answer 175 cm^2

Do not write outside the box

24 Work out $1\frac{1}{5} - \frac{3}{10}$

Give your answer as a fraction.

[2 marks]

$\frac{6}{5}$ ← Converting the mixed number into an improper fraction by multiplying the whole number by the denominator then adding the result to the numerator

$\frac{12}{10} - \frac{3}{10}$ ← Multiplying both the numerator and denominator of 6/5 by 2 to make it have the same denominator as 3/10

Answer $\frac{9}{10}$

↑ Subtracting the numerators. The denominator stays the same

25 Write down the value of sin 90°

[1 mark]

Answer 1

0 30 45 60 90
0 1 2 3 4 ← Writing the angles 0, 30, 45, 60, 90 degrees. Listing 0, 1, 2, 3, 4 under these for the sin values

$\sqrt{4}$ ← Square rooting the 4 which under the 90 gives 2

$\frac{2}{2}$ ← Putting this 2 over 2 works out that sin90 = 1

Turn over for the next question

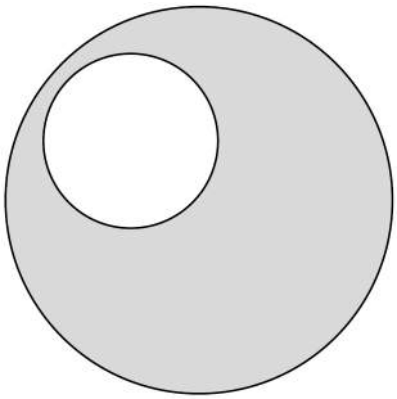
6

Do not write outside the box

26 A large circle and a small circle are shown.

The radius of the large circle is 12 cm

radius of large circle : radius of small circle = 4 : 1



Not drawn accurately

Work out the shaded area.

Give your answer in terms of π

[4 marks]

$\pi \times 12^2 = 144\pi$ ← Area of circle = π × radius^2. So the area of the large circle is 144π cm^2

$12 \div 4$ ← 4 parts of the ratio represent 12 cm. Dividing the 12 cm by 4 works out that 1 part of the ratio is worth 3 cm. This is the radius of the small circle

$\pi \times 3^2$ ← Area of circle = π × radius^2. So the area of the small circle is 9π cm^2

$144\pi - 9\pi$ ← Subtracting the area of the small circle from the area of the large circle works out that the shaded area is 135π cm^2

Answer 135π cm^2

Do not write outside the box

27 (a) In this part, assume that each person works at the same rate.

10 people can complete a job in 9 hours.

If 15 people work on the same job, how many hours will it take to complete the job?

[2 marks]

$10 \times 9 = 90$ ← Multiplying the 10 people by the 9 hours each person does works out that 90 hours worth of work is done

15, 30, 45, 60, 75, 90 ← Dividing the 90 hours worth of work by the 15 people works out that they each do 6 hours

Answer 6 hours

27 (b) In fact, of the 15 people

6 work at a slower rate

9 work at a faster rate.

What does this mean about the number of hours it will take to complete the job?

Tick **one** box.

[1 mark]

- ☐ It is greater than the answer to (a)
- ☐ It is the same as the answer to (a)
- ☐ It is less than the answer to (a)
- ☑ It is not possible to say — As it depends how much slower and how much faster the people work

END OF QUESTIONS

7