

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

Candidate Number

**Pearson Edexcel**  
**Level 1/Level 2 GCSE (9–1)**

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**Tuesday 21 May 2019**

Morning (Time: 1 hour 30 minutes)

Paper Reference **1MA1/1F**

**Mathematics**

**Paper 1 (Non-Calculator)**

**Foundation Tier**

**You must have:** Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.  
Tracing paper may be used.

Total Marks

### Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- You must **show all your working**.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- **Calculators may not be used.**



### Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*

### Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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**.CG Maths.**  
Worked Solutions



Pearson

Please note that these worked solutions have neither been provided nor approved by Pearson Education 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](mailto:curtis@cgmaths.co.uk)

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Write 180 minutes in hours.

60, 120, 180 ←

1 hour = 60 minutes. Counting in 60s finds that 180 minutes is 3 lots of 60 minutes so is 3 hours

..... 3 ..... hours

(Total for Question 1 is 1 mark)

2 Write 0.73 as a percentage.

To convert a decimal into a percentage, multiply it by 100. To do this, move the decimal point twice to the right

..... 73 ..... %

(Total for Question 2 is 1 mark)

3 Work out  $10 \times (3 + 5)$

Follow the order of operations (BIDMAS). Brackets come first and  $3 + 5 = 8$ . Then do  $10 \times 8$

..... 80 .....

(Total for Question 3 is 1 mark)

4 Write down a prime number that is between 20 and 30

Prime numbers are only divisible by themselves and 1

..... 23 .....

(Total for Question 4 is 1 mark)

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5 Find the number that is exactly halfway between 7 and 15

$15 + 7$  ← Adding the 7 and 15 works out that the total of the two numbers is 22

$22 \div 2$  ← Dividing the total of the two numbers by 2 (as there are 2 numbers) works out the mean, which works out what is halfway

11

(Total for Question 5 is 1 mark)

6 Harry is planning a holiday for 4 people for 7 days.

Here are the costs for the holiday for **each person**.

Travel	£150
Hotel	£50 for each day
Spending money	£250

Work out the total cost of the holiday for 4 people for 7 days.

$$\begin{array}{r} 50 \\ \times 7 \\ \hline 350 \\ +150 \\ +250 \\ \hline 750 \\ \times 4 \\ \hline 3000 \end{array}$$

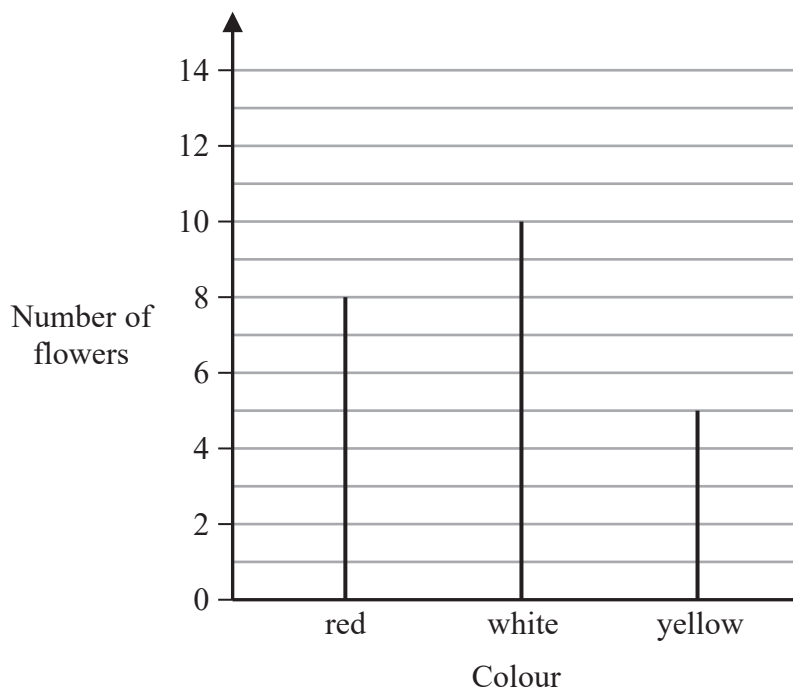
Multiplying the £50 for the hotel each day by the 7 days works out that the hotel costs £350 for each person for the 7 days  
 Adding the cost of the travel and spending money to the £350 for the hotel works out that the cost for each person for 7 days is £750  
 Multiplying the cost for each person for 7 days by the 4 people works out that the total cost of the holiday for 4 people for 7 days is £3000

£ 3000

(Total for Question 6 is 4 marks)

7 In Adam's garden, the flowers are only red or white or yellow or blue.

The chart shows the number of red flowers, the number of white flowers and the number of yellow flowers.



The total number of flowers is 30

(a) Work out the number of blue flowers.

8 + 10 + 5

There are 8 red, 10 white and 5 yellow flowers. Adding these together works out that 23 flowers are not blue

30 - 23

Subtracting the number of flowers which are not blue from the total number of flowers leaves 7 flowers which are blue

7

(2)

(b) Write down the mode.

The mode is the most frequent colour. There are more white flowers than any other colour

White

(1)

(Total for Question 7 is 3 marks)

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8 Write the following fractions in order of size.  
Start with the smallest fraction.

$$\frac{1}{3} \times 4 \quad \frac{3}{4} \times 3 \quad \frac{1}{4} \times 3 \quad \frac{7}{12} \quad \frac{1}{2} \times 6$$

$$\frac{4}{12} \quad \frac{9}{12} \quad \frac{3}{12} \quad \frac{7}{12} \quad \frac{6}{12}$$

12 is a common multiple of all of the denominators.  
Converting all the fractions into equivalent fractions which have the same denominator allows them to be easily compared

$$\frac{1}{4} \quad \frac{1}{3} \quad \frac{1}{2} \quad \frac{7}{12} \quad \frac{3}{4}$$

(Total for Question 8 is 2 marks)

9 Ruth left her home at 9 am and walked to the library.  
She got to the library at 10 30 am.  
Ruth walked at a speed of 4 mph.

(a) Work out the distance Ruth walked.

$s \begin{matrix} d \\ t \end{matrix}$  ← Writing a formula triangle for distance, speed, time

$4 \times 1 \frac{1}{2}$  ← Covering d in the formula triangle finds that distance = speed × time.  
It is  $1 \frac{1}{2}$  hours from 9 am to 10 30 am

$4 + 2$  ←  $4 \times 1 = 4$  and  $4 \times 1/2 = 2$  then adding these together

..... 6 ..... miles  
(2)

Ruth got to the library at 10 30 am.  
She stayed at the library for 50 minutes.  
Then she walked home.  
Ruth took  $1 \frac{1}{4}$  hours to walk home.

(b) At what time did Ruth get home?

$4 \overline{) 6^20}$  ← This works out that  $1/4$  of an hour is 15 minutes

$10:30$   
 $+ 0:50$   
 $+ 1:15$   

---

 $11:95$

← Adding together all the times gives 11 hours and 95 minutes

95 minutes is over 60 minutes so 60 of the minutes can be converted into an hour.  $95 - 60 = 35$  then adding the extra hour to 11 gives 12. It is pm as it is after 12 o'clock in the afternoon

..... 12:35 pm .....  
(2)

(Total for Question 9 is 4 marks)

10 (a) Solve  $t + t + t = 12$

$$3t = 12 \quad \leftarrow \boxed{t + t + t = 3t}$$

Dividing both sides by 3 gets t on its own

$$t = \dots\dots\dots 4$$

(1)

(b) Solve  $x - 2 = 6$

Adding 2 to both sides gets x on its own

$$x = \dots\dots\dots 8$$

(1)

(c) Solve  $6w + 2 = 20$

$$6w = 18 \quad \leftarrow \boxed{\text{Subtracting 2 from both sides gets the w term on its own}}$$

Dividing both sides by 6 gets w on its own

$$w = \dots\dots\dots 3$$

(2)

(Total for Question 10 is 4 marks)

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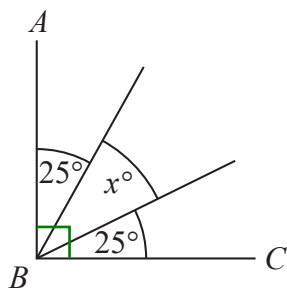
11 Work out  $74 \times 58$

$$\begin{array}{r} 74 \\ \times 58 \\ \hline 592 \\ 3700 \\ \hline 4292 \end{array}$$

.....4292

(Total for Question 11 is 2 marks)

12  $AB$  and  $BC$  are perpendicular lines.



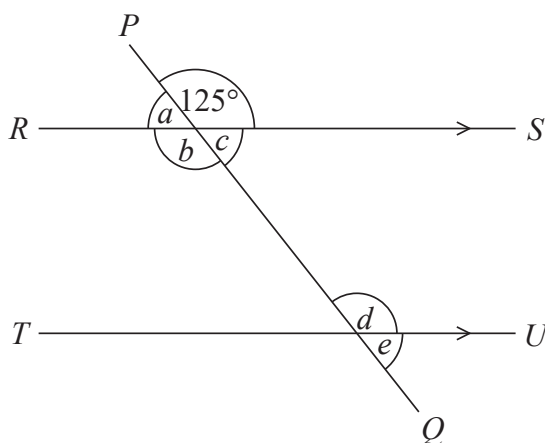
(a) Find the value of  $x$ .

$25 + 25$  ← This works out that there are  $50^\circ$  in angle ABC so far

$90 - 50$  ← Perpendicular lines meet at  $90^\circ$ . Subtracting the  $50^\circ$  there are so far leaves angle  $x$

$x = \dots\dots\dots 40 \dots\dots\dots$   
(2)

$RS$  and  $TU$  are parallel lines.  
 $PQ$  is a straight line.



An angle of size  $125^\circ$  is shown on the diagram.

(b) (i) Write down the letter of one other angle of size  $125^\circ$   
Give a reason for your answer.

$b$ , as vertically opposite angles are equal

(2)

(ii) Explain why  $a + b + c = 235^\circ$

Angles around a point add up to 360 degrees

Subtracting the  $125^\circ$  from  $360^\circ$  leaves the total of  $a + b + c$ , which is  $235^\circ$

(1)

(Total for Question 12 is 5 marks)

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13 The length of a line is  $x$  centimetres.

Write down an expression, in terms of  $x$ , for the length of the line in millimetres.

1 centimetre = 10 millimetres. So multiplying the number of centimetres by 10 converts it into millimetres

$10x$

(Total for Question 13 is 1 mark)

14 (a) Work out  $\frac{1}{5}$  of 70

$$5 \overline{) 70} \begin{array}{r} 14 \\ \underline{50} \\ 20 \\ \underline{20} \\ 0 \end{array}$$

Dividing the 70 by 5 works out  $\frac{1}{5}$  of 70

14  
(1)

Fiona has to work out the exact value of  $48 \div \frac{1}{2}$   
She writes

$$48 \div \frac{1}{2} = 24$$

Fiona's reason is,

"There are 2 halves in 1, so there will be 24 halves in 48"

(b) Explain what is wrong with Fiona's reason.

There are 96 halves in 48

There are 2 halves in 1 so doubling the number works out the number of halves

(1)

(Total for Question 14 is 2 marks)

15 (a) Write down the value of  $\sqrt{64}$

$$8^2 = 8 \times 8 = 64, \text{ so the square root of } 64 = 8$$

8

(1)

(b) Work out the value of  $5^3$

$$\begin{array}{r} 25 \\ \times 5 \\ \hline 125 \end{array}$$

$$5^3 = 5 \times 5 \times 5 = 25 \times 5$$

125

(1)

(Total for Question 15 is 2 marks)

16 (a) Expand  $5(2m - 3)$

$$\begin{array}{l} 5 \times 2m = 10m \\ 5 \times -3 = -15 \end{array}$$

10m - 15

(1)

(b) Factorise  $3n + 12$

3 is the highest common factor of  $3n$  and  $12$ .  
Bringing this outside the bracket then dividing both  $3n$  and  $12$  by  $3$  and leaving the result in a bracket

3(n + 4)

(1)

(Total for Question 16 is 2 marks)

17 Stuart throws a biased coin 10 times.  
He gets 7 Tails.

Maxine throws the same coin 50 times.  
She gets 30 Tails.

Prasha is going to throw the coin once.

- (i) Whose results will give the better estimate for the probability that she will get Tails, Stuart's or Maxine's?  
You must give a reason for your answer.

Maxine's, as she threw the coin more times

The more times it is thrown, the more reliable the estimate for the probability is

(1)

- (ii) Use Stuart's and Maxine's results to work out an estimate for the probability that Prasha will get Tails.

7 + 30 = 37 ← Adding the 7 tails for Stuart and the 30 tails for Maxine gives a total of 37 tails

10 + 50 = 60 ← Adding the 10 throws for Stuart and the 50 throws for Maxine gives a total of 60 throws

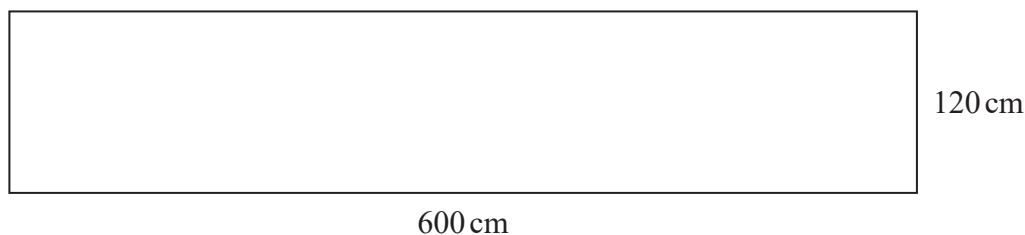
37 out of the 60 throws were tails

$\frac{37}{60}$

(1)

(Total for Question 17 is 2 marks)

18 The diagram shows a rectangular garden path.



Wasim is going to cover the path with paving stones.

Each paving stone is a square of side 30 cm.

Each paving stone costs £2.50

Wasim has £220 to spend on paving stones.

Show that he has enough money to buy all the paving stones he needs.

$$30 \overline{) 600} \begin{array}{r} 020 \\ \underline{600} \\ 0 \end{array}$$

← Dividing the 600 cm length of the path by the 30 cm length of each paving stone works out that 20 paving stones can fit along the length of the path

$$30 \overline{) 120} \begin{array}{r} 004 \\ \underline{120} \\ 0 \end{array}$$

← Dividing the 120 cm width of the path by the 30 cm length of each paving stone works out that 4 paving stones can fit along the width of the path

$$20 \times 4$$

← Multiplying the 20 paving stones along the length by the 4 paving stones along the width works out that 80 paving stones are needed

$$\begin{array}{r} 2.50 \\ \times 80 \\ \hline 200.00 \\ 4 \end{array}$$

← Multiplying the £2.50 for each paving stone by the 80 paving stones works out that the total cost for the paving stones needed is £200, which is less than the £220 so he has enough money

(Total for Question 18 is 4 marks)

19 (a) Work out  $\frac{2 \times 5}{3 \times 5} - \frac{1 \times 3}{5 \times 3}$

$$\frac{10}{15} - \frac{3}{15}$$

Multiplying both the numerator and denominator of the 1st fraction by 5 and multiplying both the numerator and denominator of the 2nd fraction by 3 to make the denominators the same

The numerators can be subtracted and the denominator stays the same

$$\frac{7}{15}$$

(2)

(b) Work out  $\frac{2}{3} \times \frac{3}{4}$

Give your answer as a fraction in its simplest form.

$$\frac{6}{12}$$

To multiply fractions: multiply the numerators and multiply the denominators.  $2 \times 3 = 6$  and  $3 \times 4 = 12$

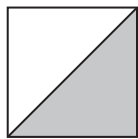
Dividing both the numerator and denominator by 6 simplifies the fraction. It cannot go any simpler as 1 and 2 cannot be divided by the same amount to get smaller whole numbers

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

(2)

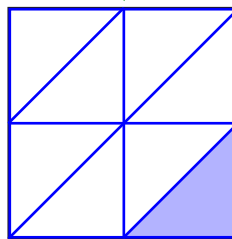
(Total for Question 19 is 4 marks)

20 Here are two squares, A and B.



A

Four of square A can fit into square B.  $\frac{1}{8}$  of square B is shaded



B

The length of the side of square A is 50% of the length of the side of square B.

Express the area of the shaded region of square A as a percentage of the area of square B.

$$8 \overline{) 012.5} \\ \underline{8 \phantom{0} 0} \phantom{.} \phantom{0} \\ 4 \phantom{0} \phantom{.} \phantom{0} \\ \underline{4 \phantom{0} \phantom{.} \phantom{0}} \\ 0 \phantom{.} \phantom{0} \\ \underline{0 \phantom{.} \phantom{0}} \\ 0$$

← Doing  $\frac{1}{8}$  of 100% converts  $\frac{1}{8}$  to a percentage

..... 12.5 %

(Total for Question 20 is 3 marks)

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21 There are 40 students in a class.  
Each student walks to school or cycles to school or gets the bus to school.

There are 22 girls in the class.  
9 of the girls walk to school.  
7 of the boys cycle to school.  
6 of the 10 students who get the bus to school are boys.

Find the number of these students who walk to school.

	W	C	B	
B	5	7	6	18
G	9			22
	14		10	40

Doing a two-way table to organise the information. B and G stand for boys and girls. W, C and B stand for walk, cycle and bus. Filling in the given information then working out missing numbers until the number of students who walk is found. There is no need to complete the whole table

This is the number of students who walk

14

(Total for Question 21 is 4 marks)

22 There are only blue cubes, red cubes and yellow cubes in a box.

The table shows the probability of taking at random a blue cube from the box.

<b>Colour</b>	blue	red	yellow
<b>Probability</b>	0.2	0.4	0.4

The number of red cubes in the box is the same as the number of yellow cubes in the box.

(a) Complete the table.

$$\begin{array}{r} 1.0 \\ -0.2 \\ \hline 0.8 \div 2 \end{array}$$

It is certain to get one of the colours so the probabilities must add to 1. Subtracting the probability of blue from 1 leaves 0.8 for the probability of red or yellow. Then dividing this by 2 as red and yellow must have equal probabilities works out that they are each 0.4

(2)

There are 12 blue cubes in the box.

(b) Work out the total number of cubes in the box.

$$12 \div 0.2$$

Multiplying the total number of cubes by the probability of blue would give the number of blue cubes. So dividing the 12 blue cubes by the probability of blue gives the total number of cubes

$$2 \overline{) 060} \\ \underline{120} \\ 0$$

Multiplying both 12 and 0.2 by 10 eliminates the decimal in 0.2 and makes the division easier.  $12 \div 0.2$  is the same as  $120 \div 2$

60

(2)

(Total for Question 22 is 4 marks)

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23 Deon needs 50 g of sugar to make 15 biscuits.

She also needs

- three times as much flour as sugar
- two times as much butter as sugar

Deon is going to make 60 biscuits.

(a) Work out the amount of flour she needs.

15, 30, 45, 60 ← Counting in 15s to 60 finds that 60 biscuits is 4 lots of 15 biscuits

$50 \times 3$  ← Multiplying the 50 g of sugar by 3 works out that 150 g of flour is needed for 15 biscuits

$150 \times 4$  ← Multiplying the 150 g of flour needed for 15 biscuits by 4 works out that 600 g of flour is needed for 60 biscuits

600 g  
(3)

Deon has to buy all the butter she needs to make 60 biscuits. She buys the butter in 250 g packs.

(b) How many packs of butter does Deon need to buy?

$50 \times 2$  ← Multiplying the 50 g of sugar by 2 works out that 100 g of butter is needed for 15 biscuits

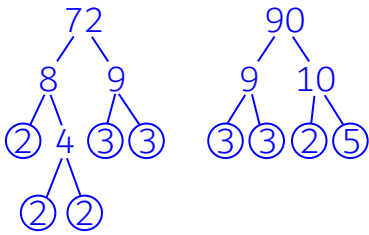
$100 \times 4 = 400$  ← Multiplying the 100 g of butter needed for 15 biscuits by 4 works out that 400 g of butter is needed for 60 biscuits

250, 500 ← Counting in 250s finds that 2 packs of butter are needed to get at least 400 g of butter

2  
(2)

(Total for Question 23 is 5 marks)

24 Find the highest common factor (HCF) of 72 and 90



Doing factor trees for 72 and 90. So as a product of prime factors,  $72 = 2^3 \times 3^2$  and  $90 = 2 \times 3^2 \times 5$

$2 \times 3^2$  ← The highest common factor is the lowest power of each prime in both product of prime factors multiplied together

18

(Total for Question 24 is 2 marks)

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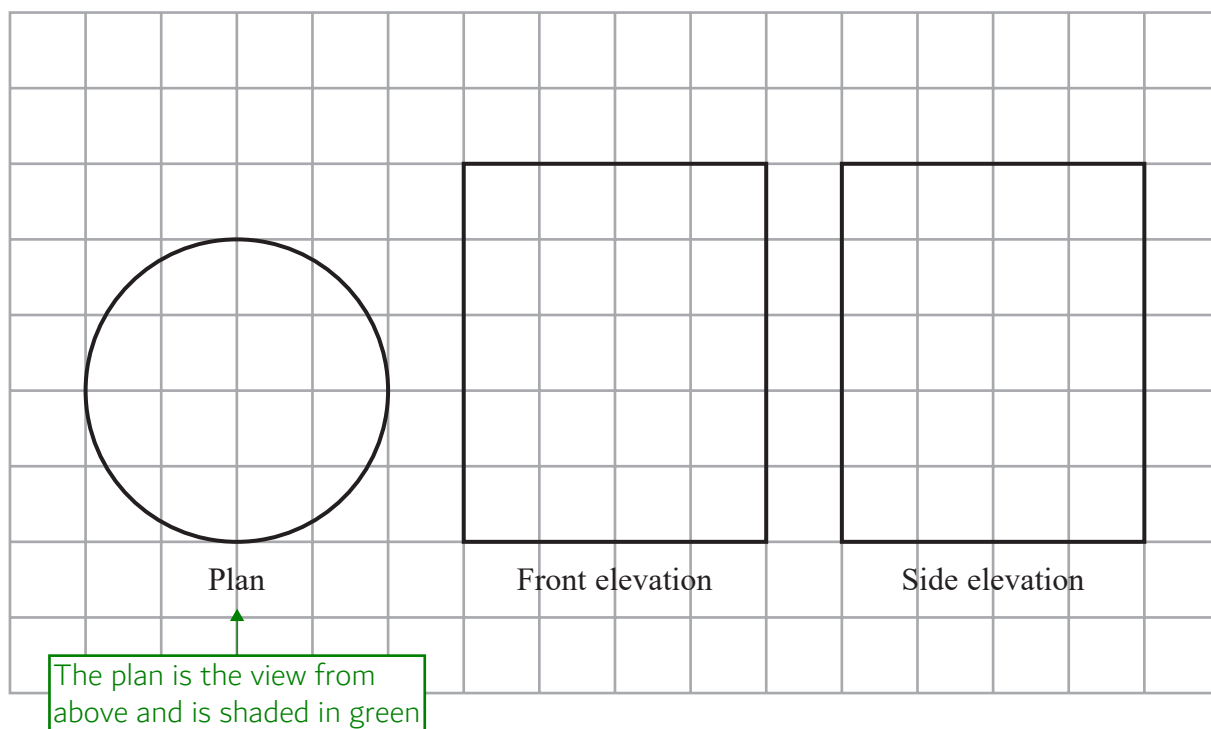
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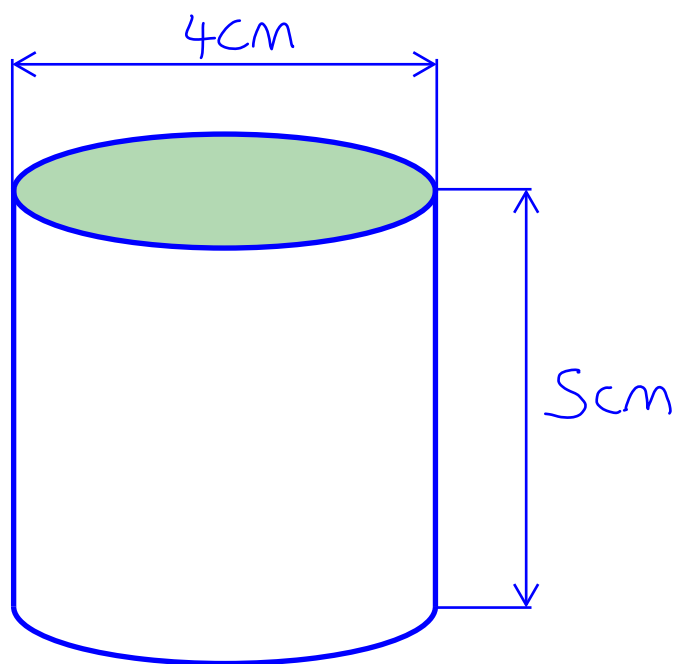
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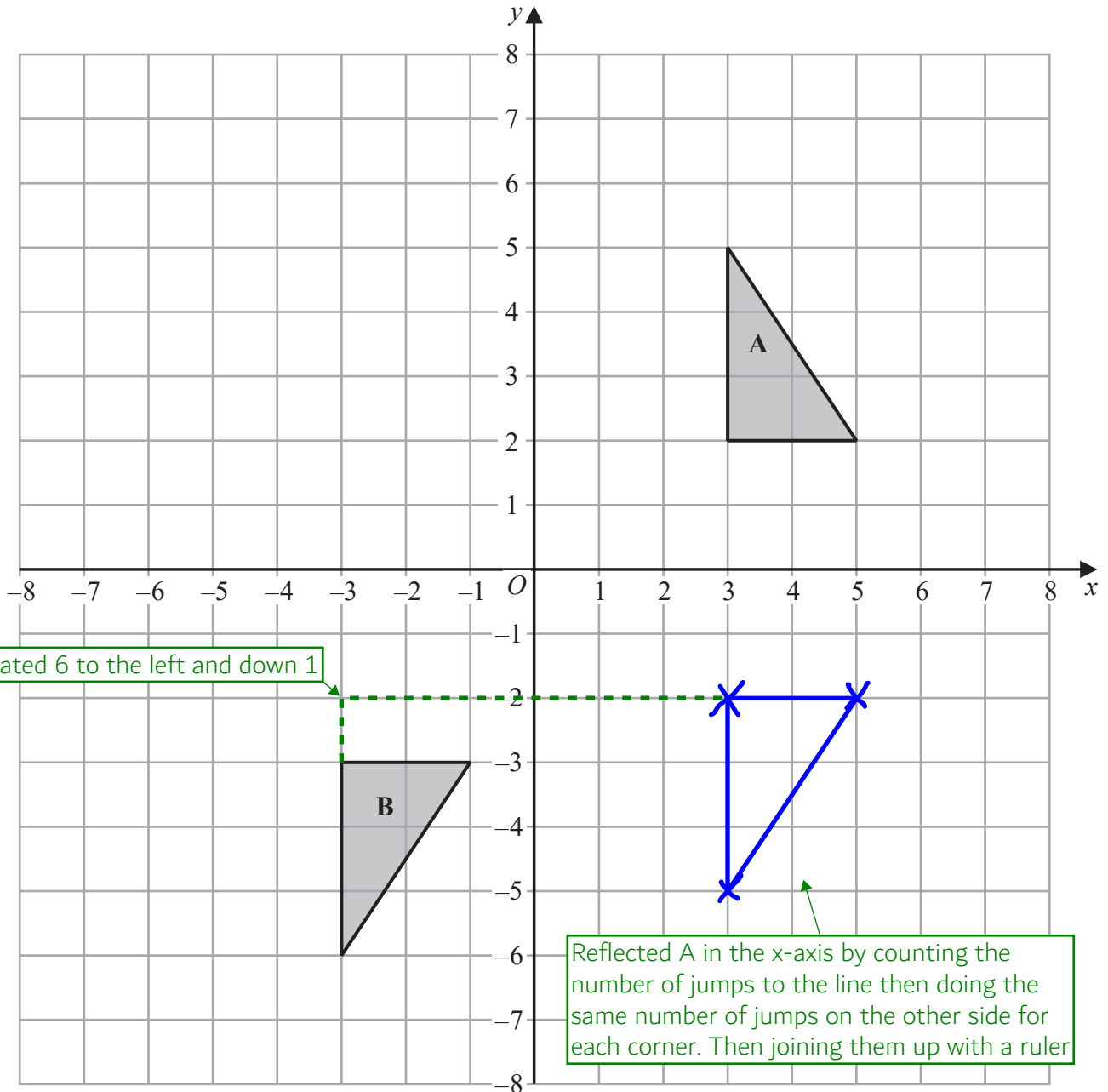
25 The diagram shows the plan, front elevation and side elevation of a solid shape, drawn on a centimetre grid.



In the space below, draw a sketch of the solid shape.  
Give the dimensions of the solid on your sketch.



(Total for Question 25 is 2 marks)



Translated 6 to the left and down 1

Reflected A in the x-axis by counting the number of jumps to the line then doing the same number of jumps on the other side for each corner. Then joining them up with a ruler

Shape A can be transformed to shape B by a reflection in the  $x$ -axis followed by a translation  $\begin{pmatrix} c \\ d \end{pmatrix}$

Find the value of  $c$  and the value of  $d$ .

x-component (how far moved in the x-direction)  $\rightarrow c = \dots -6$

y-component (how far moved in the y-direction)  $\rightarrow d = \dots -1$

(Total for Question 26 is 3 marks)

27 A shop sells packs of black pens, packs of red pens and packs of green pens.

There are

2 pens in each pack of black pens

5 pens in each pack of red pens

6 pens in each pack of green pens

On Monday,

number of packs of black pens sold : number of packs of red pens sold : number of packs of green pens sold = 7:3:4

A total of 212 pens were sold.

Work out the number of green pens sold.

14 : 15 : 24 ← Multiplying the number of parts representing the numbers of packs by the number of pens of the colour in that pack works out the ratio of the number of pens of each colour.  $7 \times 2 = 14$  and  $3 \times 5 = 15$  and  $4 \times 6 = 24$

$$\begin{array}{r} 14 \\ + 15 \\ + 24 \\ \hline 53 \\ 1 \end{array}$$
 ← Adding the numbers of parts in the ratio of the number of pens of each colour works out that there are 53 parts in total, which represent the total of 212 pens

$$\begin{array}{r} 0 \ 0 \ 4 \\ 53 \overline{) 212} \\ \underline{106} \\ 106 \\ \underline{106} \\ 0 \end{array}$$
 ← Dividing the 212 pens by the 53 parts which represent them works out that 1 part of the ratio is worth 4 pens

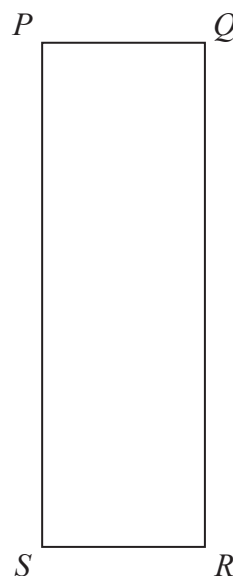
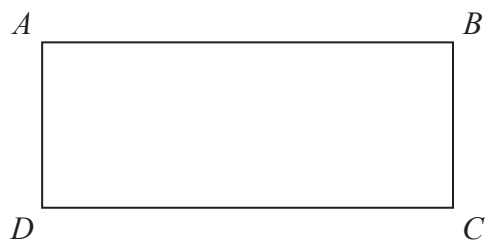
53, 106, 159, 212 ← Counting in 53s can help with the division

$$\begin{array}{r} 24 \\ \times 4 \\ \hline 96 \\ 1 \end{array}$$
 ← Multiplying the 24 parts for green pens by the value of 1 part works out that there are 96 green pens sold

96

(Total for Question 27 is 4 marks)

28 Here are two rectangles.



$$QR = 10 \text{ cm}$$

$$BC = PQ$$

The perimeter of  $ABCD$  is 26 cm

The area of  $PQRS$  is  $45 \text{ cm}^2$

Find the length of  $AB$ .

$$45 \div 10$$

Area of rectangle = length  $\times$  width. So width = area of rectangle  $\div$  length.  
The length of rectangle PQRS is 10 cm. Dividing the area of  $45 \text{ cm}^2$  by 10 cm works out that the width PQ is 4.5 cm

$$4.5 + 4.5 + x + x$$

$BC = PQ$  so BC is 4.5 cm. AD is also 4.5 cm as opposite sides of a rectangle are equal. Let AB be  $x$ . DC is also  $x$  as opposite sides of a rectangle are equal. Adding all the outside sides expresses the perimeter of ABCD

$$2x + 9 = 26$$

Collecting like terms and setting equal to the 26 cm, which is the value of the perimeter of ABCD

$$2x = 17$$

Subtracting 9 from both sides gets the  $x$  term on its own

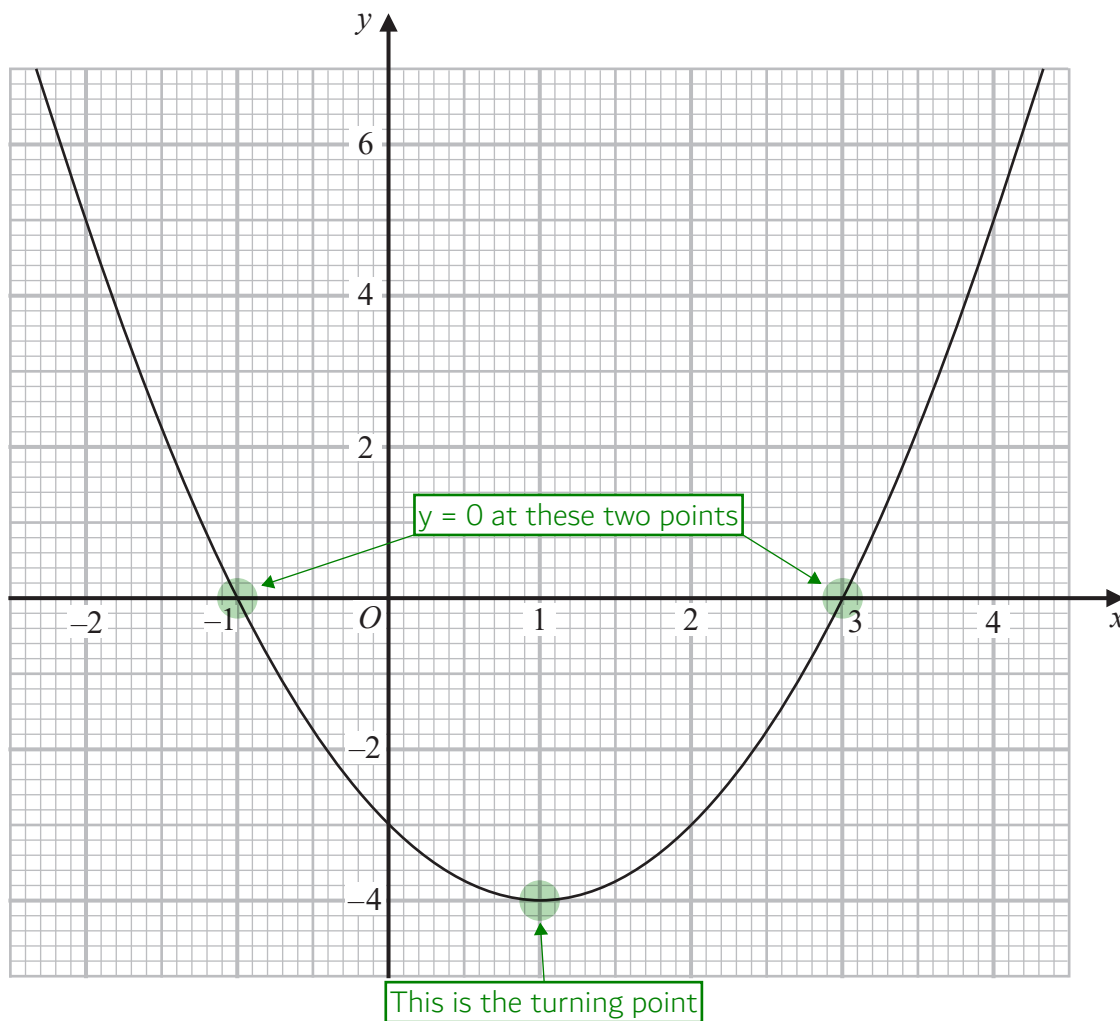
Dividing both sides by 2 gets  $x$  on its own

$$\frac{17}{2}$$

..... cm

(Total for Question 28 is 4 marks)

29 Here is the graph of  $y = x^2 - 2x - 3$



(a) Write down the coordinates of the turning point on the graph of  $y = x^2 - 2x - 3$

(..... 1 ....., -4 .....)  
(1)

(b) Use the graph to find the roots of the equation  $x^2 - 2x - 3 = 0$

y has been replaced with 0. So it is basically asking what the x values are when  $y = 0$

..... -1 and 3 .....  
(2)

(Total for Question 29 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS