Please check the examination details below before entering your candidate information

Candidate surname	Other names

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

Centre Number | | | | | |

Candidate Number | | | | |

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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6/7/1/1/1/1/

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 indicates what must be written in order to answer the questions and get the marks. The worked solutions have been designed to show the smallest amount of work which needs to be done to answer the question.

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

Anything written in orange in a rectangle doesn't have to be written in the exam and is there to show what should be put into a calculator or measured using a ruler or protractor.

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

.CG Maths.

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.

$\frac{180}{60} \overset{\div 10}{=} \frac{18}{6}$

There are 60 minutes in an hour. Dividing by 60 works out how many lots of 60 minutes are in 180 minutes and therefore works out how many hours it is

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 place 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 x 8

80

(Total for Question 3 is 1 mark)

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

Prime numbers only have two factors (whole numbers they can be divided by), themselves and one. 29 is also a prime number in this range

23

(Total for Question 4 is 1 mark)

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

$\frac{7+15}{2}$

Calculating the mean works out the middle number. Add both the numbers together and then divide by 2 as there are 2 numbers

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.

$50 \times 7 = 350$

The hotel is £50 for each day and they are going 7 days. This works out the cost of the hotel for each person

$150 + 350 + 250 = 750$

Adding up the travel, hotel and spending money to work out the total cost for one person

$750 \times 4 = 3000$

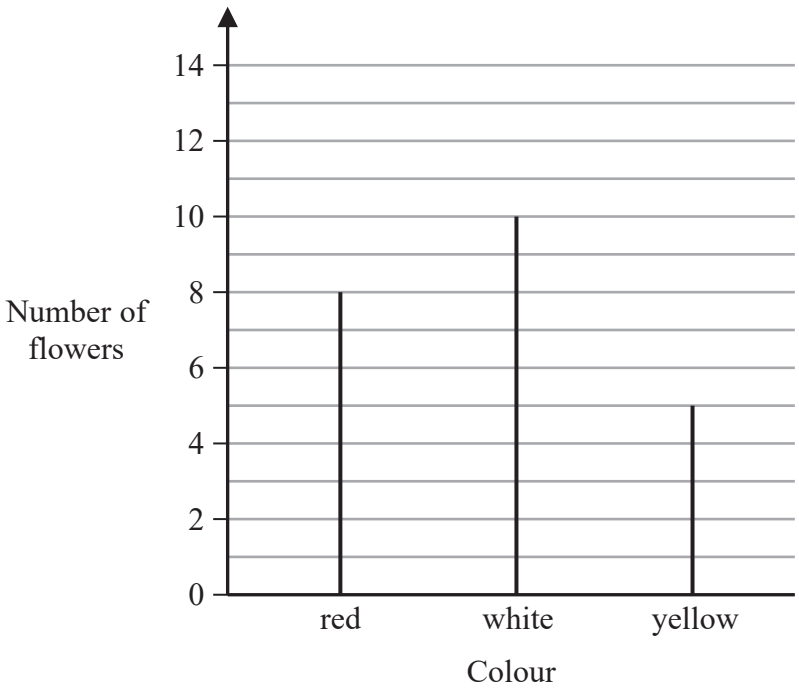
It costs £750 per person. There are 4 people going on the holiday so multiplying the cost per person by 4 works out the total cost of the holiday

£ 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.

$8 + 10 + 5 = 23$ ← There are 8 red, 10 white and 5 yellow flowers. Adding these together works out how many flowers aren't blue

$30 - 23$ ← Subtracting the number of flowers which aren't blue from the total number of flowers leaves the number of flowers which are blue

7

(2)

(b) Write down the mode.

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

White

(1)

(Total for Question 7 is 3 marks)

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

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

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

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

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

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

(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.

There are 60 minutes in an hour. 30 minutes is half an hour. So 1 hour and 30 minutes is $1^1/_2$ hours. Multiplying the speed of 4mph by the number of hours gives the distance

$\frac{30}{60} = \frac{1}{2}$ $4 \times 1\frac{1}{2}$

(a) Work out the distance Ruth walked.

s d t d = st

From the formula triangle, distance = speed x time. The time needs to be in hours to be compatible with miles per hour

10:30 − 9:00 = 1:30

Working out that the difference between 9am and 10:30am is 1 hour and 30 minutes

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?

15
4 | 60

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 is over 60 so 60 of the minutes can be converted into another 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 $t + t + t = 12$

$3t = 12$

t + t + t = 3t. Dividing both sides by 3 makes t the subject

$t =$ 4

(1)

(b) Solve $x - 2 = 6$

Adding 2 to both sides makes x the subject

$x =$ 8

(1)

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

$6w = 18$

Subtract 2 from both sides. Then divide both sides by 6

$w =$ 3

(2)

(Total for Question 10 is 4 marks)

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11 Work out 74×58

$$\begin{array}{r} 74 \\ \times 58 \\ \hline 592 \\ 3700 \\ \hline 4292 \\ {\scriptstyle 1} \end{array}$$

Remember to add a 0 on the second line

4292

(Total for Question 11 is 2 marks)

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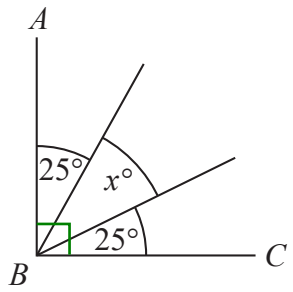
12 AB and BC are perpendicular lines.



(a) Find the value of x.

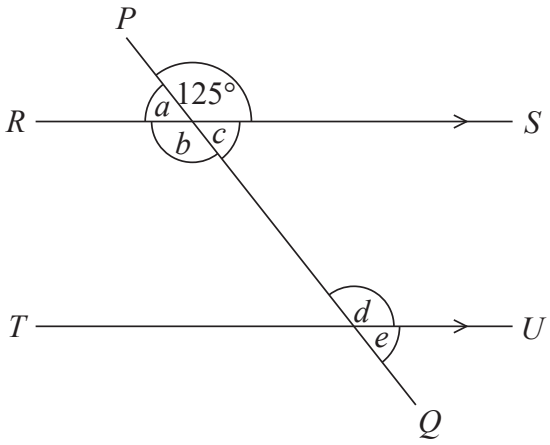
25 + 25 = 50 ← Working out how many degrees are currently in the angle ABC

90 − 50 ← Perpendicular lines meet at 90 degrees. Subtracting the 50 degrees there are so far leaves angle x

$x =$ 40

(2)

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



An angle of size 125° is shown on the diagram.

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

b, as vertically opposite angles are equal

Could also be d as corresponding angles are equal

(2)

(ii) Explain why $a + b + c = 235°$

Angles around a point add up to 360 degrees

a + b + c + 125 = 360
Subtracting 125 from both sides gives
a + b + c = 235

(1)

(Total for Question 12 is 5 marks)

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.

There are 10 millimetres in a centimetre 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

$5\overline{)70}$ 14

To find a fraction of an amount, divide the amount by the denominator then multiply by the numerator. The numerator is 1 and multiplying by 1 does not change the value

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

(1)

(Total for Question 14 is 2 marks)

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

8 squared (multiplied by itself) is 64 so the square root of 64 is 8

8

(1)

(b) Work out the value of 5^3

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

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

125

(1)

(Total for Question 15 is 2 marks)

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

5 x 2m = 10m
5 x -3 = -15

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 terms by 3 and leaving them in the bracket

3(n + 4)

(1)

(Total for Question 16 is 2 marks)

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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

Repeating an event more times will give a better estimate for the probability of the event happening

(1)

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

$\frac{7+30}{10+50}$

7 + 30 gives the total number of tails. 10 + 50 gives the total number of times the coin was thrown. Expressing the number of tails as a fraction of the number of throws gives an estimate for the probability of getting tails

$\frac{37}{60}$

(1)

(Total for Question 17 is 2 marks)

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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.

$\frac{600}{30} \times \frac{120}{30}$ ← 600/30 works out how many tiles go along the length of the path. 120/30 works out how many tiles go along the width of the path. Multiplying these together works out how many tiles there are altogether

20×4 ← Simplifying 600/30 by dividing the numerator and denominator by 10 gives 60/3, which is 20. Simplifying 120/30 by dividing the numerator and denominator by 10 gives 12/3, which is 4

$2.50 \times 80 = £200.00$ ← There are 80 tiles and each costs £2.50 so this works out the total cost of the tiles

The total cost of £200 is less than the £220 Wasim has to spend

(Total for Question 18 is 4 marks)

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

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

A common multiple of 3 and 5 is 15. Multiplying both the numerator and denominator by the same amount to keep the fractions equivalent. Once the denominators are the same the numerators can be subtracted

$\frac{7}{15}$

(2)

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

Give your answer as a fraction in its simplest form.

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

Multiply the numerators together and the denominators together. 2 x 3 = 6. 3 x 4 = 12

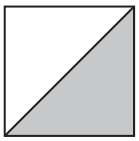
Divide both the numerator and denominator by the same amount to simplify the fraction until they can't be divided by the same amount any further

$\frac{1}{2}$

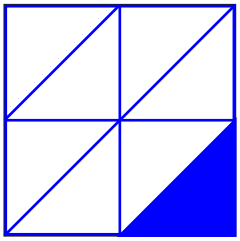
(2)

(Total for Question 19 is 4 marks)

20 Here are two squares, **A** and **B**.



A



B

Four of square A can fit into square B. 1/8 of the diagram is shaded

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**.

$\frac{1}{8} \times 100$

Multiply a fraction by 100 to convert it into a percentage

$$8\overline{)10^{2}0.^{4}0}$$

$$1\,2.5$$

12.5 ..... %

(Total for Question 20 is 3 marks)

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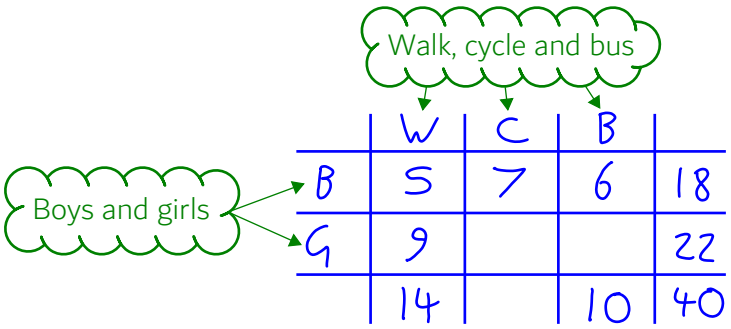
21 There are 40 students in a class.
Each student walks to school or cycles to school or gets the bus to school.

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.



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.

Colour	blue	red	yellow
Probability	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.

$1 - 0.2 = 0.8$ The probabilities all add up to 1 as it is certain to pick one of the colours.

$\frac{0.8}{2}$ There are the same number as red as yellow so the probabilities must be the same.

(2)

There are 12 blue cubes in the box.

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

$0.2x = 12$ Where x is the total number of cubes.

$x = \frac{12}{0.2} = \frac{120}{2}$ Rearranging and simplifying.

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.

$\frac{60}{15} = 4$ Calculating how many lots of 15 are in 60 biscuits.

$4 \times 50 = 200$ Calculating how much sugar is needed. Each lot of 15 biscuits needs 50g and there are 4 lots.

3×200 There is three times as much flour as sugar.

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?

$2 \times 200 = 400$ There is two times as much flour as sugar.

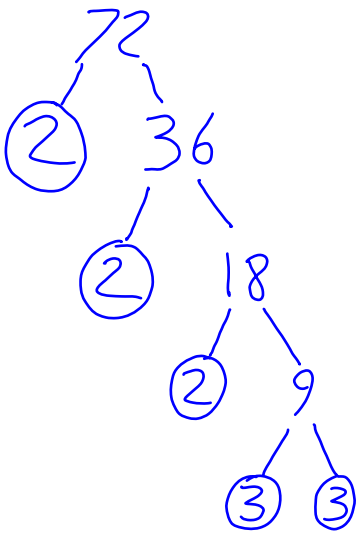
$\frac{400}{250} = 1 \text{ r } 150$ Calculating how many packs of butter are needed. There is a remainder so we need to round up.

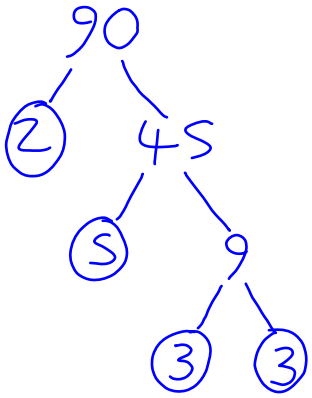
2

(2)

(Total for Question 23 is 5 marks)

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





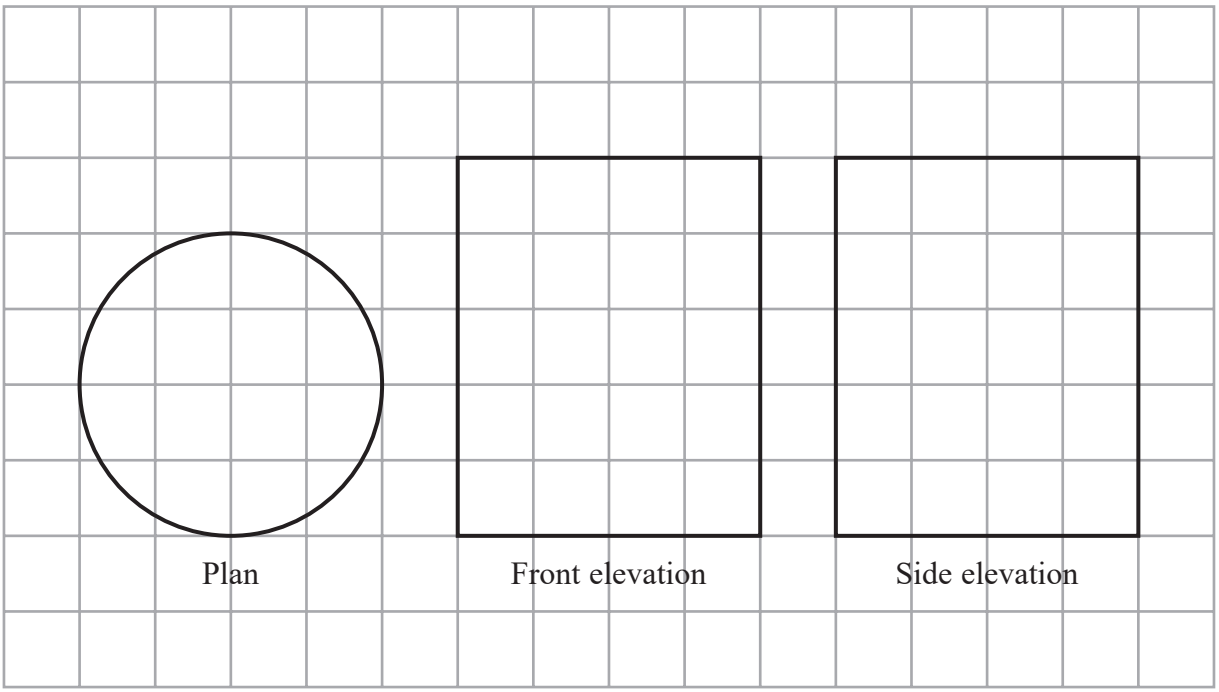
Listing factor trees to find the prime factors of both 72 and 90. Any common prime factors (2, 3 and 3) are multiplied together to get the HCF.

2 x 3 x 3

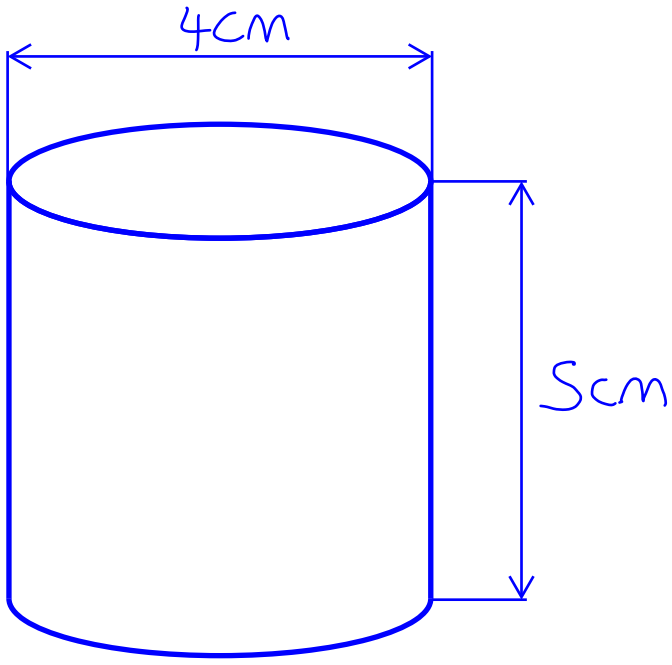
18

(Total for Question 24 is 2 marks)

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

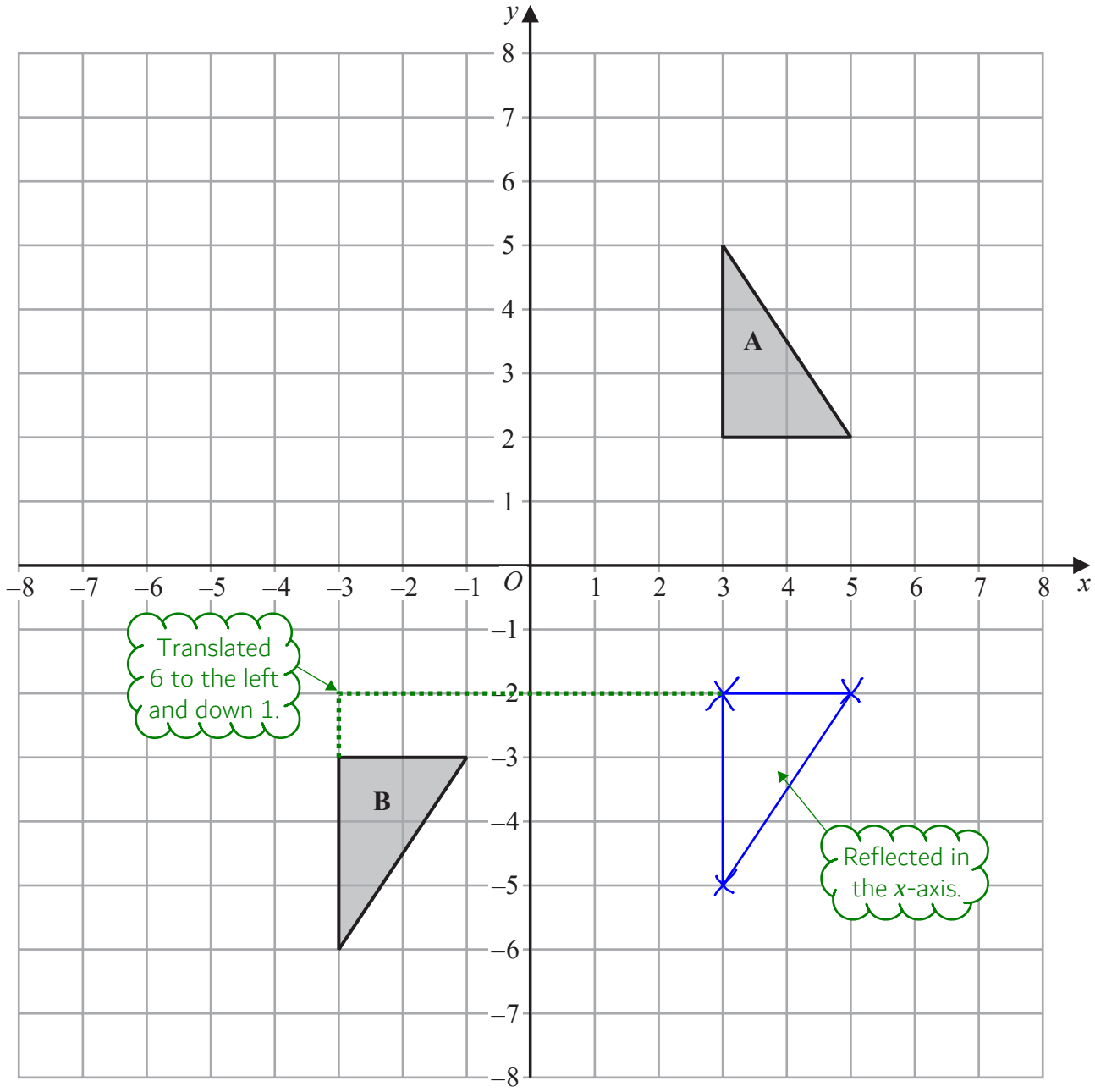


In the space below, draw a sketch of the solid shape.
Give the dimensions of the solid on your sketch.



(Total for Question 25 is 2 marks)

26



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.

$c =$ -6

$d =$ -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

Converting the ratio in terms of the number of pens rather than number of packs.
2 x 7 = 14
5 x 3 = 15
6 x 4 = 24

$$\begin{array}{r} 14 \\ +15 \\ +24 \\ \hline 53 \end{array}$$

Calculating how many parts there are in total in the ratio.

$$\frac{212}{53} = 4$$

Calculating what one part of the ratio is by dividing by the number of parts.

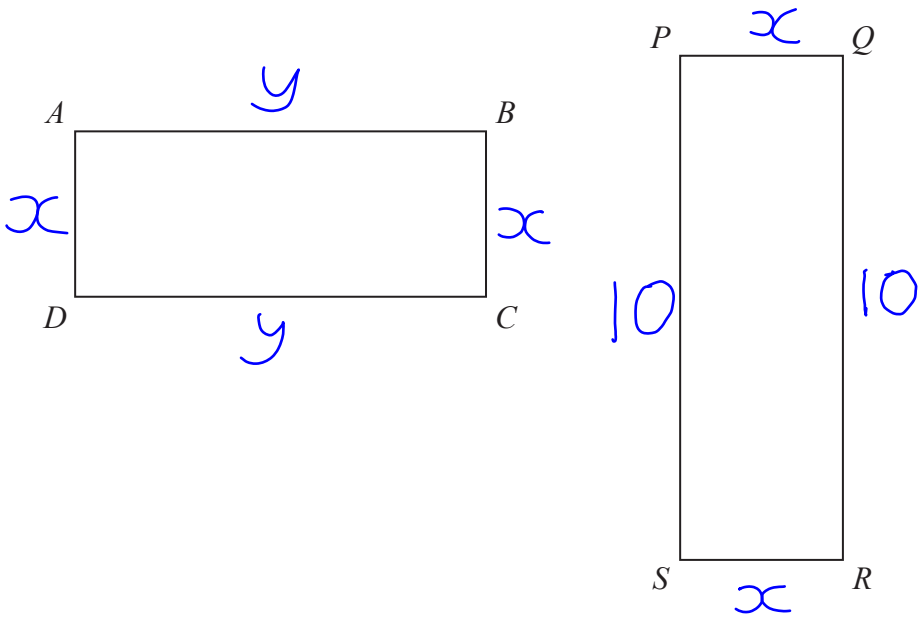
$$\begin{array}{r} 24 \\ \times\ 4 \\ \hline 96 \end{array}$$

Calculating what 24 parts of the ratio are worth.

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 cm^2

Find the length of AB.

$10x = 45$
$x = 4.5$

Area of rectangle = base x height
base = x , height = 10
Area = 45

$2 \times 4.5 + 2y = 26$

$2y = 26 - 9$

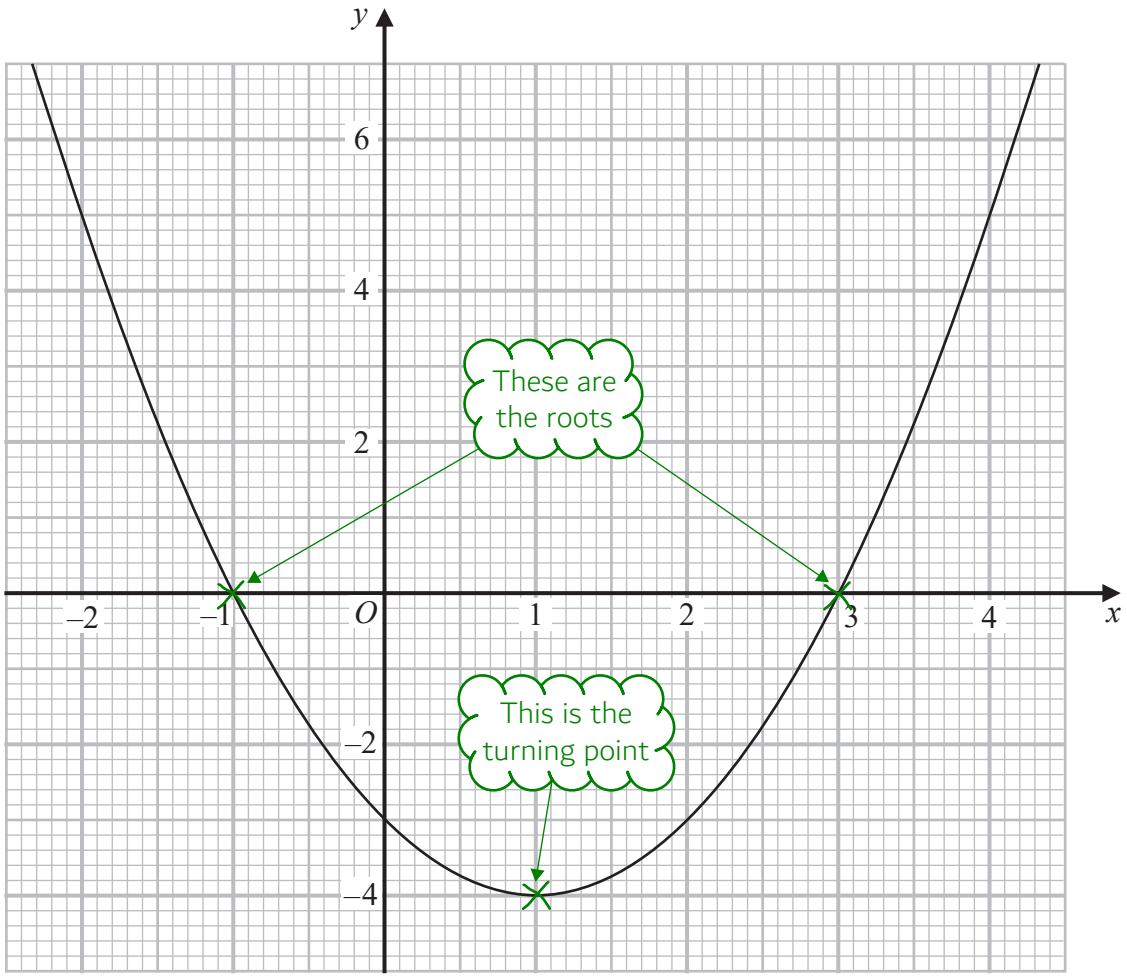
$y = \frac{17}{2}$

The perimeter can be calculated by adding up all the sides. This creates an equation which can be rearranged to find side y.

$\frac{17}{2}$ ..... 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 $x^2 - 2x - 3 = 0$

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