

Write your name here

Surname

Other names

Centre Number

Candidate Number

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

# Mathematics

## Paper 2 (Calculator)

**Foundation Tier**

Monday 6 November 2017 – Morning

**Time: 1 hour 30 minutes**

Paper Reference

**1MA1/2F**

**You must have:** Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. 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 be used.**
- If your calculator does not have a  $\pi$  button, take the value of  $\pi$  to be 3.142 unless the question instructs otherwise.



### 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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6/6/7/2/

# .CG Maths.

Hints



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](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  $\frac{7}{100}$  as a decimal.

Type into calculator and press the SD button

(Total for Question 1 is 1 mark)

- 2 Write down a multiple of 6 that is between 40 and 50

$6 \times 4 = 24$  so 24 is an example of a multiple of 6. We could count in sixes until we reach a number between 40 and 50

(Total for Question 2 is 1 mark)

- 3 (a) Simplify  $3f \times 5g$

Multiplication can be done in any order so  $3 \times 5$  can be done first. Then the result is multiplied by  $f$  and  $g$

(1)

- (b) Simplify  $t \times t$

Squared means multiplied by itself

(1)

- (c) Simplify  $\frac{2n + 6n}{2}$

Add  $2n$  and  $6n$  then divide by 2

(1)

(Total for Question 3 is 3 marks)

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4 Ken buys some fruit.

He buys apples, bananas, peaches and oranges.  
Ken buys

- 4 apples      weighing 125 g each
- 2 bananas    weighing 170 g each
- 3 peaches    weighing 135 g each

Each orange has a weight of 90 g.

The fruit has a total weight of 1.785 kg.

(a) Work out how many oranges Ken buys.

Convert the total weight into grams as the other weights are given in grams. There are 1000g in 1kg. Subtracting the weight of 4 apples, 2 bananas and 3 peaches leaves the weight of the oranges

.....  
(3)

Jane wants to buy 15 tomatoes.  
She asks for 1 kg of tomatoes at a shop.  
Jane assumes that each tomato has a weight of 75 g.

(b) (i) If Jane's assumption is correct, will she get 15 tomatoes?  
You must show how you get your answer.

Convert 1kg into grams so the units are the same.  
Then work out how many lots of 75g go into it

(2)

(ii) If Jane's assumption is **not** correct, could she get 15 tomatoes?  
Justify your answer.

Jane's assumption was that each tomato has a weight of 75g. Ignoring this means that the tomatoes could be any weight

.....  
.....  
(1)

(Total for Question 4 is 6 marks)

5 60 students were asked how they get to school.

The table shows the results.

	Bus	Walk	Car	Bicycle
Number of students	15	27	12	6

(a) What fraction of the 60 students did **not** walk to school?

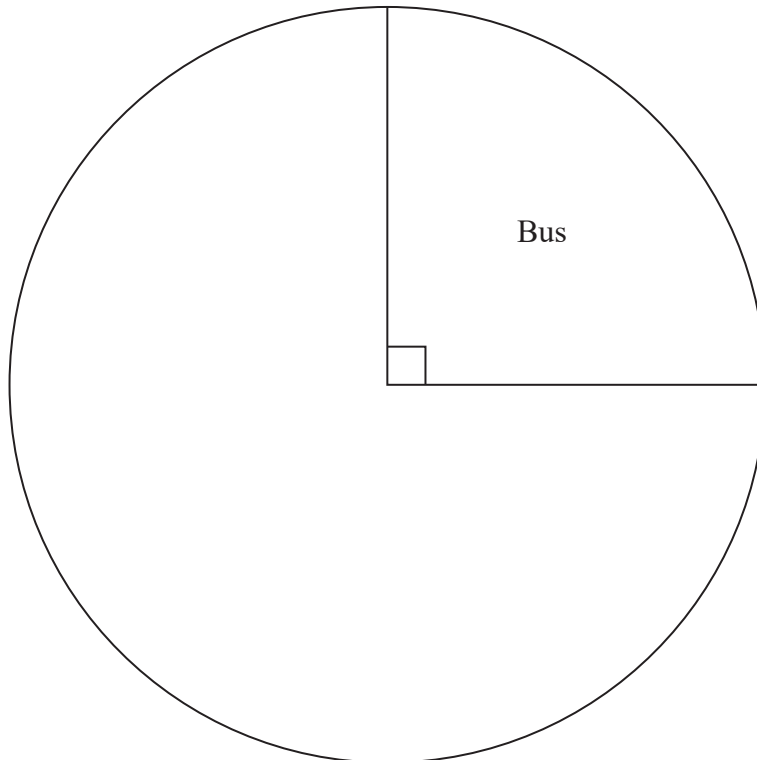
Work out how many students didn't walk then put it as the numerator

60

(2)

(b) Complete the pie chart for the information in the table.

There are 360 degrees in total in a pie chart. Dividing this by the total frequency works out how many degrees represent one person. Then multiply each of the categories by this to work out the angle for each



(4)

(Total for Question 5 is 6 marks)

6 Annie and Lily share some money in the ratio 4 : 3

(a) What fraction of the money does Lily get?

There are 7 parts in total. 3 out of these are for Lily

.....  
(1)

Rosie and Dan share some sweets.

Dan gets  $\frac{1}{4}$  of the sweets.

(b) Write down the ratio of the number of sweets Rosie gets to the number of sweets Dan gets.

Dan gets 1 out of a total of 4 parts

.....  
(1)

**(Total for Question 6 is 2 marks)**

7 Steve says,

“There are more prime numbers between 20 and 30  
than there are between 10 and 20”

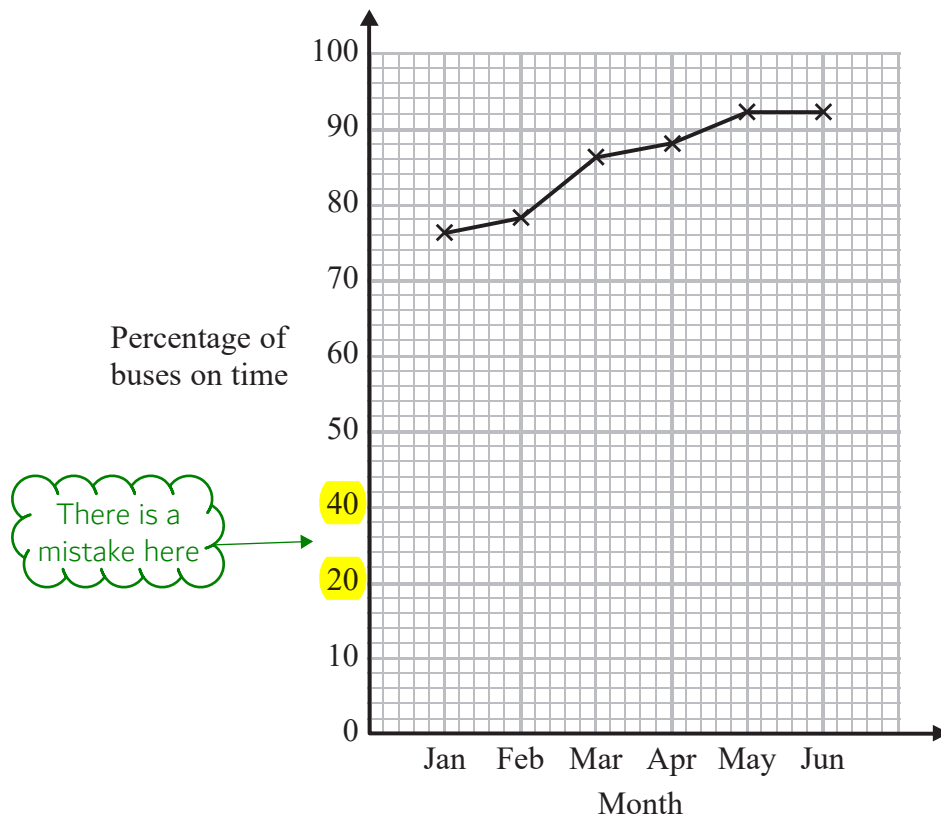
Is Steve right?

You must show how you get your answer.

Prime numbers only have two factors: themselves  
and 1. List the prime numbers between 10 and 20  
then between 20 and 30 to see how many there are

**(Total for Question 7 is 2 marks)**

- 8 Chrissy drew this graph to show the percentage of buses that got to a bus stop on time for six months.



- (a) Write down **one** thing that is wrong with the graph.

(1)

- (b) Describe the trend in the percentage of buses that got to the bus stop on time.

If we were to draw a line of best fit, how would that be described?

(1)

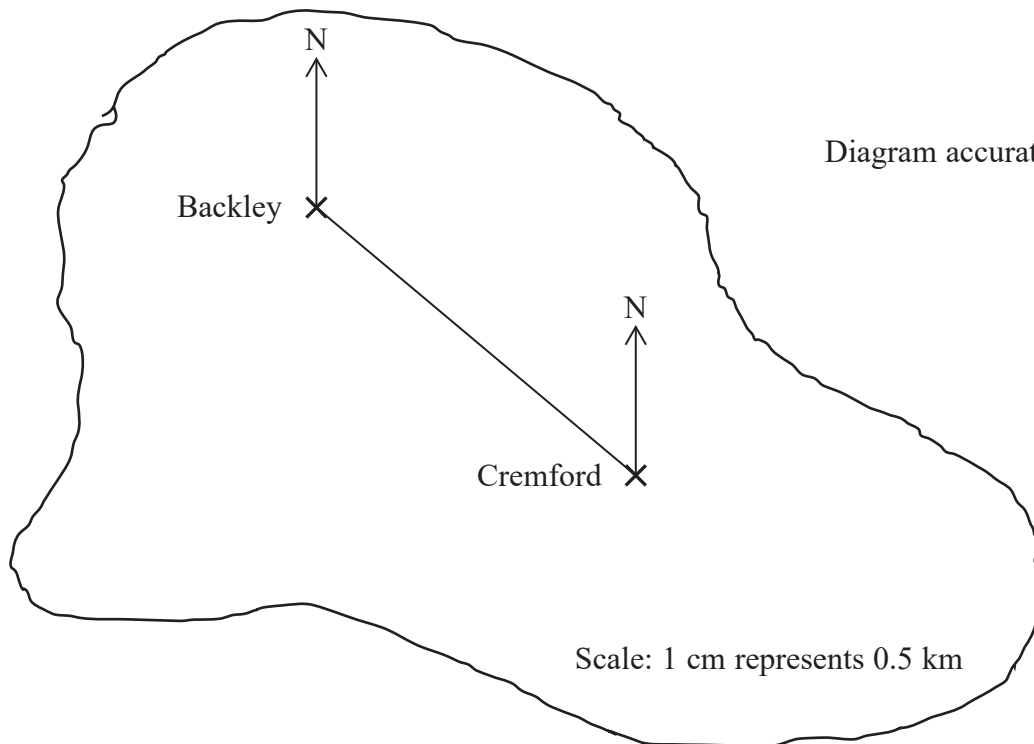
(Total for Question 8 is 2 marks)

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9 Here is a map of an island.



A straight road joins the two villages, Backley and Cremford.

(a) Work out the real distance between the two villages.

Measure the distance on the map in centimetres using a ruler then multiply it by 0.5

..... km  
(2)

(b) Find the bearing of Cremford from Backley.

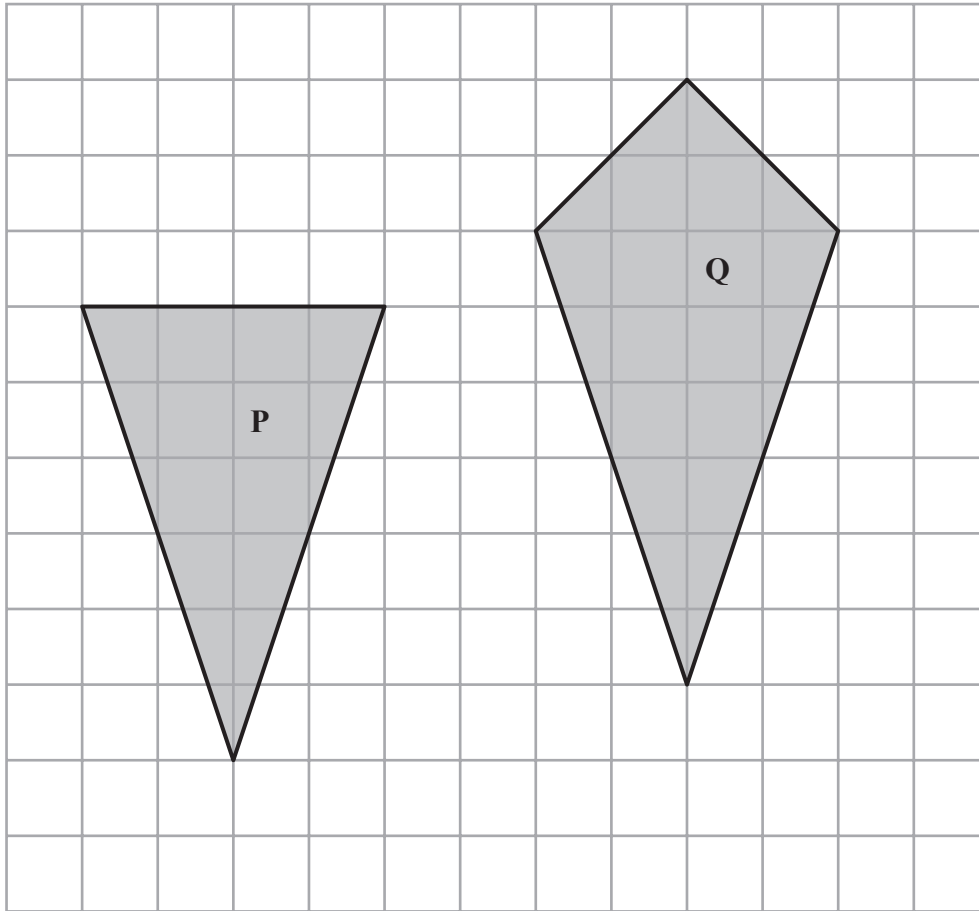
The number of degrees turned clockwise from north to face Cremford from Backley

..... °  
(1)

(Total for Question 9 is 3 marks)



10 The diagram shows two shapes drawn on a centimetre grid.



(a) Find the area of shape P.

Area of triangle =  $\frac{1}{2} \times \text{base} \times \text{height}$

.....  
(2)

(b) Write down the mathematical name of quadrilateral Q.

.....  
K...  
(1)

(Total for Question 10 is 3 marks)

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11 The table shows a cricket club's income in 2016 from a fete, a quiz and membership fees.

	Income	
<b>Fete</b>	£250	
<b>Quiz</b>	Entry fees	13 at £5 each
	Refreshments	£35
<b>Membership fees</b>	25 at £20 each	

Express as a ratio

the income from the fete to the income from the quiz to the income from membership fees.

Give your ratio in its simplest form.

Work out the income from the quiz. Work out the income from the membership fees. Express the ratio in the form income from fete : quiz : membership fees. Simplify the ratio by dividing all sides by the same amount until they can't be divided any further

(Total for Question 11 is 3 marks)

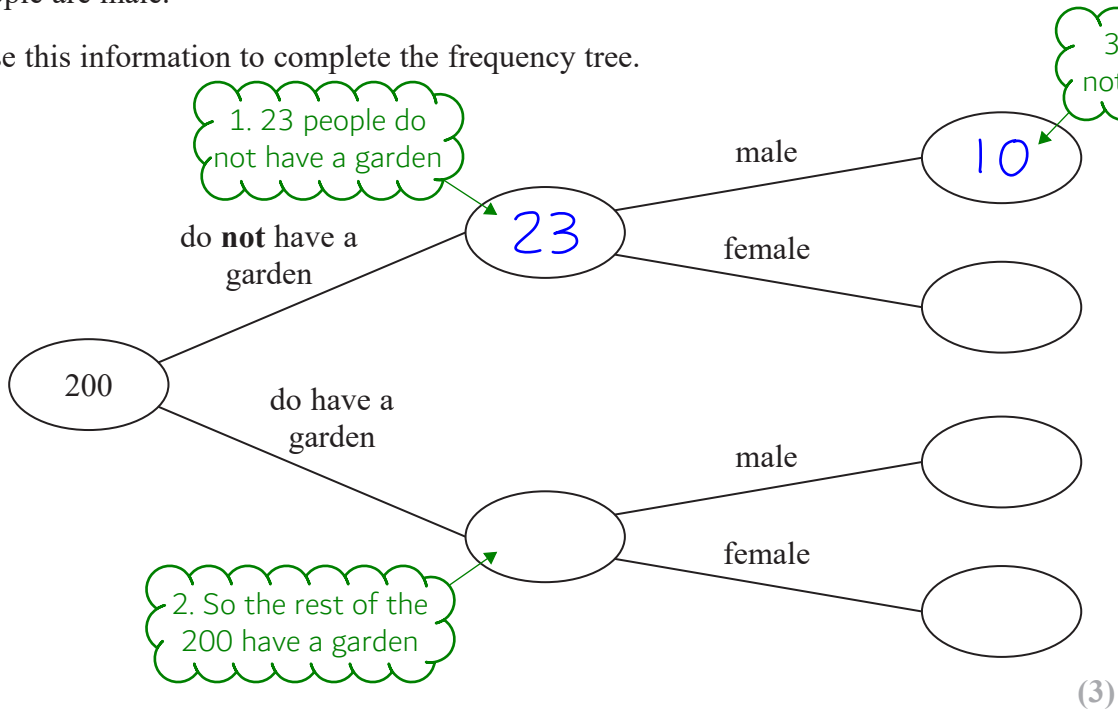
12 200 people live in a village.

23 people do **not** have a garden.

10 males do **not** have a garden.

95 people are male.

(a) Use this information to complete the frequency tree.



One of the people who does **not** have a garden is chosen at random.

(b) Write down the probability that this person is female.

Express the number of females who do not have a garden as a fraction of the total number of people who do not have a garden

.....  
(2)

(Total for Question 12 is 5 marks)

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- 13 Ellie makes hats.  
She makes at least 17 hats per hour.  
She is paid 46p for each hat she makes.

Reaze is a waiter.  
He works 35 hours and is paid a total of £266

Show that Ellie's hourly rate of pay is more than Reaze's hourly rate of pay.

Work out the minimum amount Ellie earns each hour (this is when she only makes 17 hats). Work out Reaze's hourly rate. All we need to do is show the two figures

(Total for Question 13 is 3 marks)

14  $a$  and  $b$  are odd numbers.

(a) Give an example to show that the value of  $2(a + b)$  is a multiple of 4

Substitute any odd numbers for  $a$  and  $b$ . Multiples of 4 are any number in the 4 times table

(2)

(b) Show that, when  $a$  and  $b$  are both odd numbers, the value of  $2(a + b)$  will always be a multiple of 4

odd + odd =

(2)

(Total for Question 14 is 4 marks)

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15 Mr Page uses oil to heat his home.

At the beginning of November there were 1000 litres of oil in his oil tank.

Mr Page bought enough oil to fill the tank completely.

He paid 50p per litre for this oil.

He paid a total amount of £750

At the end of February Mr Page had 600 litres of oil in the tank.

He bought enough oil to fill the tank completely.

The cost of oil had increased by 4%.

Work out the total amount Mr Page paid for the oil he bought in February.

Every £0.50 paid is 1 litre of fuel. Working out how many lots of £0.50 are in £750 works out how many litres were bought in November.

Adding the number of litres bought in November to the 1000 litres it started with works out the full capacity of the tank.

Work out the difference between the full capacity and the 600 litres he had in February to work out how much he buys.

Increase the £0.50 by 4% and multiply the new price per litre by the number of litres he buys

£.....

(Total for Question 15 is 5 marks)

16 Solve  $5x - 6 = 3(x - 1)$

Expand the brackets on the right side. Bring all the x terms to the same side. Eliminate all of the other terms on the side with the x terms. Divide by the number before x to get x on its own

$x = \dots\dots\dots$

(Total for Question 16 is 3 marks)

17 Emily buys a pack of 12 bottles of water.  
The pack costs £5.64

Emily sells all 12 bottles for 50p each.

Work out Emily's percentage profit.  
Give your answer correct to 1 decimal place.

Percentage profit = percentage change  
= (new - original)/original x 100. The  
new amount is what she sells them for in  
total and the original is £5.64

$\dots\dots\dots\%$

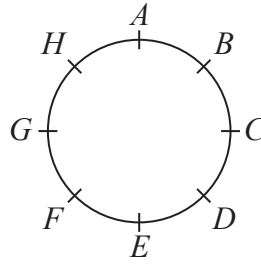
(Total for Question 17 is 3 marks)

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18 Hasmeet walks once round a circle with diameter 80 metres.



There are 8 points equally spaced on the circumference of the circle.

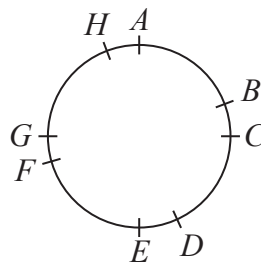
(a) Find the distance Hasmeet walks between one point and the next point.

$$\text{Circumference} = \pi \times \text{diameter}$$

.....m

(2)

Four of the points are moved, as shown in the diagram below.



Hasmeet walks once round the circle again.

(b) Has the mean distance that Hasmeet walks between one point and the next point changed? You must give a reason for your answer.

$$\text{Mean} = \text{total} / \text{number} \text{ where total is the total distance and the number is the number of points}$$

(1)

(Total for Question 18 is 3 marks)



19 There are only blue cubes, yellow cubes and green cubes in a bag.

There are

twice as many blue cubes as yellow cubes  
and four times as many green cubes as blue cubes.

Hannah takes at random a cube from the bag.

Work out the probability that Hannah takes a yellow cube.

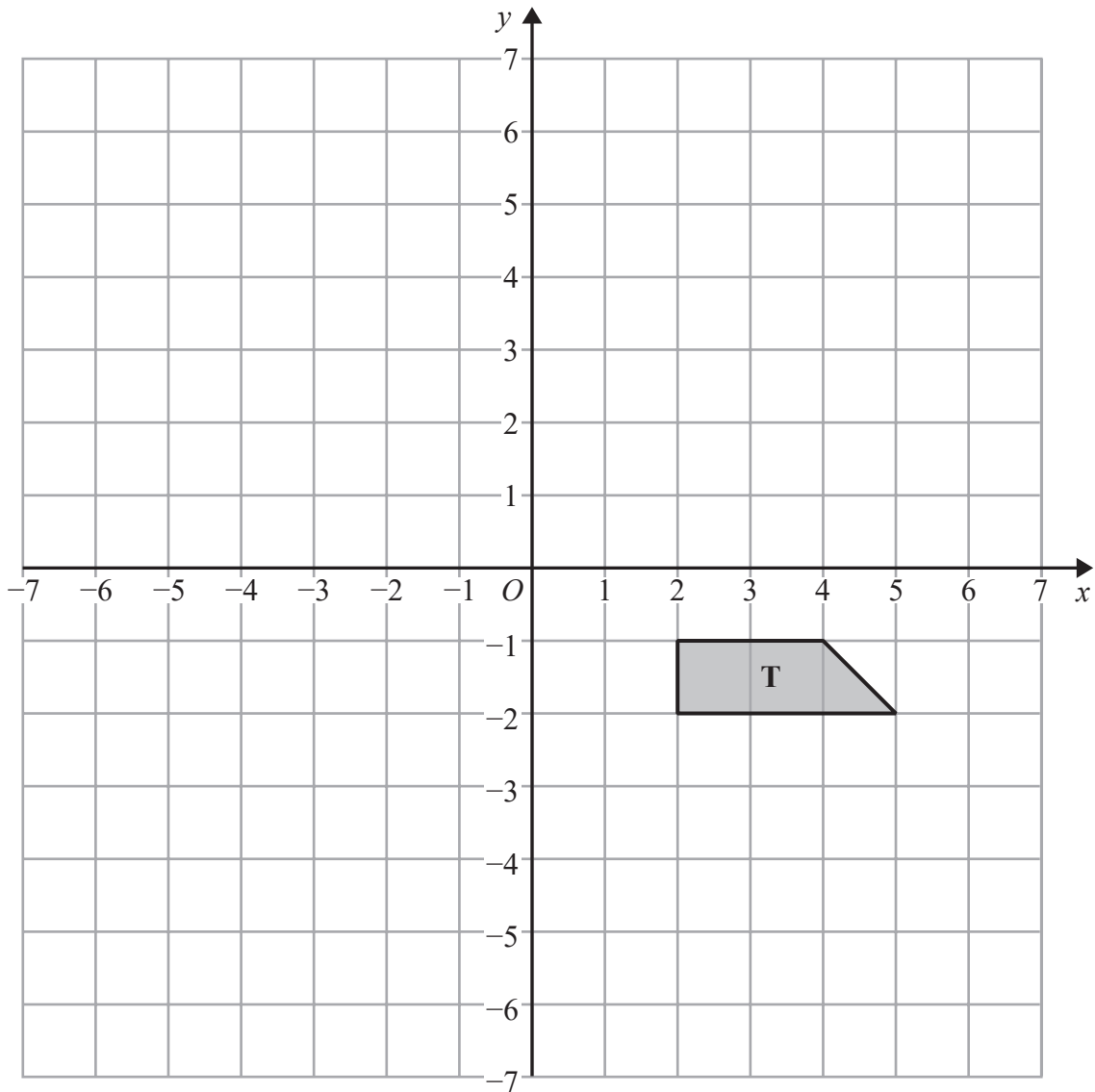
Write the ratio of yellow : blue : green. Let there be 1 part for yellow.  
There are twice as many blue so there are ? parts for blue. There are  
four times as many green so there are ? parts for green. Then express  
the number of parts for yellow as a fraction of the total number of parts

(Total for Question 19 is 3 marks)

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- (a) Rotate trapezium **T**  $180^\circ$  about the origin.  
Label the new trapezium **A**.

Use tracing paper to sketch around T then rotate the paper  $180^\circ$  about the origin  $(0, 0)$

(1)

- (b) Translate trapezium **T** by the vector  $\begin{pmatrix} -1 \\ -3 \end{pmatrix}$   
Label the new trapezium **B**.

-1 in the x direction and  
-3 in the y direction

(1)

(Total for Question 20 is 2 marks)

21  $p^3 \times p^x = p^9$

(a) Find the value of  $x$ .

$$a^x \times a^y = a^{x+y}$$

$$x = \dots\dots\dots (1)$$

$$(7^2)^y = 7^{10}$$

(b) Find the value of  $y$ .

$$(a^x)^y = a^{xy}$$

$$y = \dots\dots\dots (1)$$

$100^a \times 1000^b$  can be written in the form  $10^w$

(c) Show that  $w = 2a + 3b$

Start by expressing 100 and 1000 as powers of 10 in the form  $10^n$  and setting the expression equal to  $10^w$ . The equation can be simplified using  $(a^x)^y = a^{xy}$  and  $a^x \times a^y = a^{x+y}$ . Once  $10^w$  is on one side and  $10^2$  is on the other, the powers can be set equal to each other

(2)

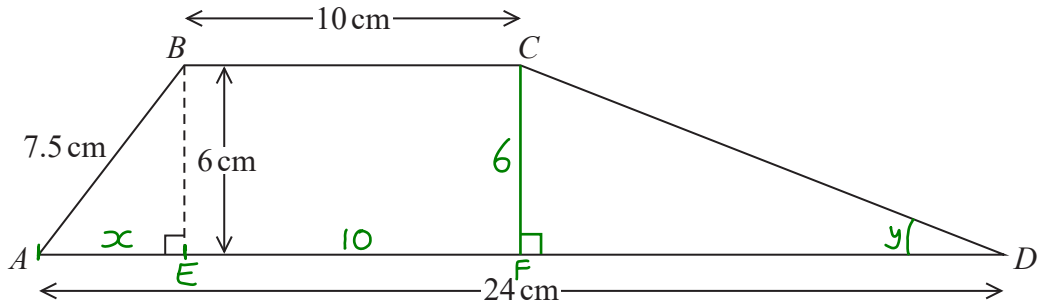
(Total for Question 21 is 4 marks)

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22  $ABCD$  is a trapezium.



Work out the size of angle  $CDA$ .  
 Give your answer correct to 1 decimal place.

Pythagoras' Theorem can be used to find  $x$  as we have two sides of the right-angled triangle  $ABE$ .  $a^2 + b^2 = c^2$ . We can then work out side  $FD$  by subtracting  $x$  and  $EF$  from  $24$ .

Triangle  $CFD$  is right-angled so SOH CAH TOA can be used to find the angle  $CDA$

(Total for Question 22 is 5 marks)

23 Use your calculator to work out  $\sqrt{\frac{\sin 25^\circ + \sin 40^\circ}{\cos 25^\circ - \cos 40^\circ}}$

(a) Write down all the figures on your calculator display.

Type into the calculator

2.7...

(2)

(b) Write your answer to part (a) correct to 2 decimal places.

Use the third decimal place to round the second decimal place. Then ignore all the decimal places after the second

(1)

(Total for Question 23 is 3 marks)

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24 (a) Solve  $2x^2 = 72$

$$x^2 = 36$$

Divided both sides by 2

Next, eliminate the square by performing the opposite operation on both sides. There should be two solutions

.....  
(2)

(b) Expand and simplify  $(2x + 1)(3x - 2)$

.....  
(2)

(c) Factorise  $x^2 + 6x + 9$

Find two numbers which multiply to give the constant (number not involving  $x$ ) and which add to give the number before  $x$ . Put these in the brackets with  $x$

$$(x + 3)(x + 3)$$

.....  
(1)

(Total for Question 24 is 5 marks)

TOTAL FOR PAPER IS 80 MARKS