

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

Candidate Number

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

Time 1 hour 30 minutes

Paper
reference

1MA1/2F

Mathematics PAPER 2 (Calculator) Foundation Tier

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 π button, take the value of π 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.
- 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

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Write 31% as a fraction.

Percentage is out of 100

$\frac{31}{100}$

(Total for Question 1 is 1 mark)

2 Change 3 metres into centimetres.

There are 100 centimetres in a metre so multiplying the 3 metres by 100 converts it to centimetres

300

centimetres

(Total for Question 2 is 1 mark)

3 Write the following numbers in order of size.
Start with the smallest number.

1.02 0.12 1.20 0.21

Compare the units then the tenths. The numbers with 0 units are the smallest. 0.12 only has 1 tenth so is smaller than 0.21. Both of the other numbers have 1 unit. 1.02 has 0 tenths so is smaller than 1.20

0.12, 0.21, 1.02, 1.20

(Total for Question 3 is 1 mark)

4 (a) Simplify $m + m + m + m$

There are 4 lots of m

4m

(1)

(b) Simplify $12p \div 4$

$12 \div 4 = 3$ and the p stays

3p

(1)

(Total for Question 4 is 2 marks)

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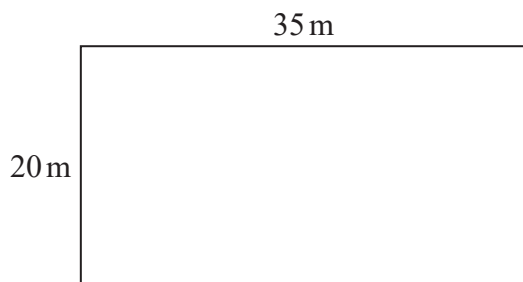


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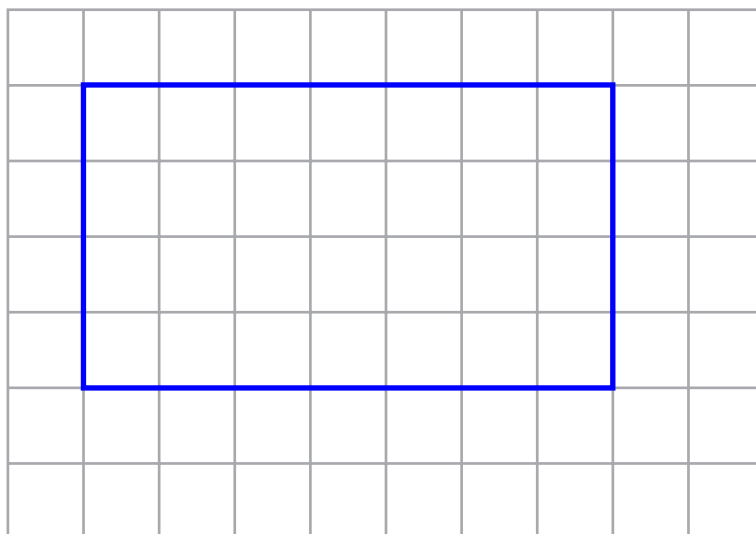
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5 The diagram shows a rectangle.



On the centimetre grid below, draw an accurate scale drawing of this rectangle. Use a scale of 1 cm to represent 5 m.



(Total for Question 5 is 2 marks)

Dividing the length and width in metres by 5 works out how many centimetres represent them. $35 \div 5 = 7$ and $20 \div 5 = 4$



6 Here is a list of whole numbers from 21 to 30

21 22 23 24 25 26 27 28 29 30

(a) From the list, write down a square number.

$$5^2 = 5 \times 5 = 25 \text{ so } 25 \text{ is a square number}$$

25

(1)

(b) From the list, write down a multiple of 8

$$3 \times 8 = 24 \text{ so it is a multiple of } 8$$

24

(1)

(Total for Question 6 is 2 marks)

7 A baker has three bags of flour, **A**, **B** and **C**.

Bag **A** and bag **B** contain the same amount of flour.

Bag **C** contains 940 g of flour.

In the three bags, there is a total of 2500 g of flour.

Work out the amount of flour in bag **A**.

$$2500 - 940$$

← Subtracting the 940 g mass of C from the total 2500 g mass finds that the total mass of A and B is 1560 g

$$1560 \div 2$$

← As A and B contain the same amount, dividing the total mass of A and B by 2 finds that the mass of A is 780 g

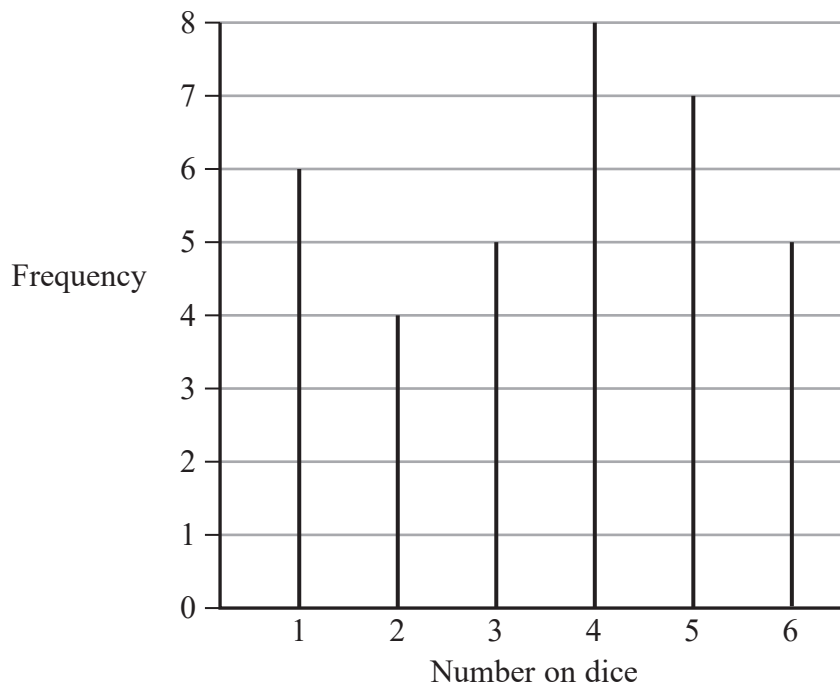
780

g

(Total for Question 7 is 3 marks)

- 8 5 students throw a dice.
They each throw the dice the same number of times.

The diagram gives information about the number of times the dice lands on each number.



Work out how many times each student throws the dice.

$6 + 4 + 5 + 8 + 7 + 5$ ← Adding up all the frequencies finds that there were a total of 35 throws

$35 \div 5$ ← Dividing the 35 total number of throws by the 5 students finds that each student throws the dice 7 times

..... 7

(Total for Question 8 is 3 marks)

- 9 Alec needs to work out the value of $2 + 3 \times 4$

He writes

$$2 + 3 = 5 \text{ and } 5 \times 4 = 20, \text{ so } 2 + 3 \times 4 = 20$$

Alec is wrong.
Explain why.

Should do 3×4 first

The order of operations (BIDMAS) has not been followed

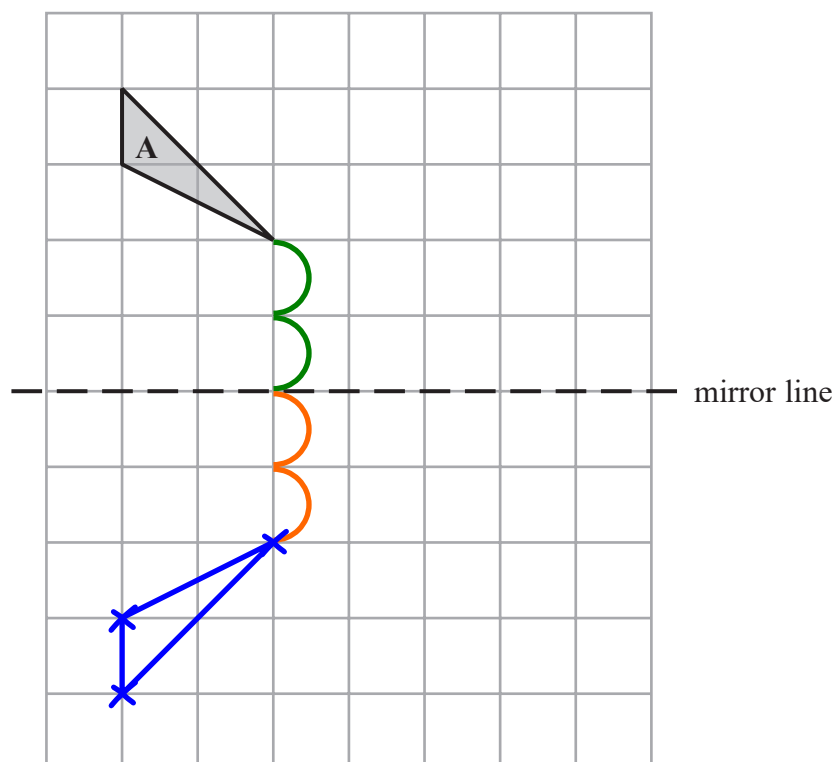
(Total for Question 9 is 1 mark)

- 10 Write 17 as a fraction of 30

$$\frac{17}{30}$$

(Total for Question 10 is 1 mark)

- 11 Reflect shape A in the mirror line.



(Total for Question 11 is 2 marks)

Counting the number of jumps to the line then doing the same number of jumps on the other side for each corner then joining up the corners

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12 (a) Work out $\sqrt{\frac{13.82}{4.06}}$

Write down all the figures on your calculator display.

Type into the calculator exactly as it is above

1.844977205

(2)

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

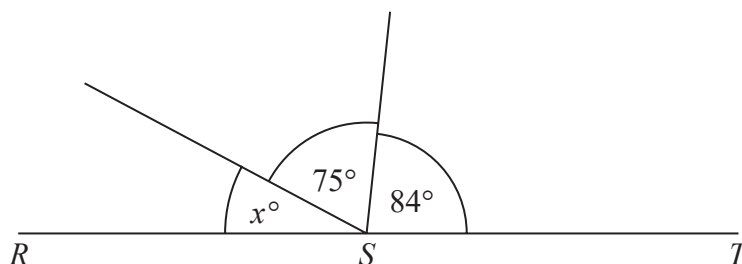
The 1st 4 is in the 2nd decimal place. The 4 in the next place causes the 1st 4 to round down then everything after the 2nd decimal place is ignored

1.84

(1)

(Total for Question 12 is 3 marks)

13



RST is a straight line.

(i) Work out the value of x .

$180 - 75 - 84$

21

(2)

(ii) Give a reason for your answer.

Angles around a point on a straight line add up to 180°

(1)

(Total for Question 13 is 3 marks)



14 Nazima uses this graph to find out how much money she is paid for the number of hours she has worked.



This is halfway between 10 and 20 so must be 15

(a) How much money is Nazima paid for each hour she works?

Reading up from 1 hour to the line then across works out what Nazima is paid for each hour

£ 15
(1)

Last week Nazima worked for 36 hours.

(b) How much money was Nazima paid?

15×36 ← Multiplying what is paid in 1 hour by the 36 hours finds that £540 is paid

£ 540
(2)

(Total for Question 14 is 3 marks)



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

$$\frac{5}{8} \quad \frac{2}{3} \quad \frac{4}{9} \quad \frac{3}{5}$$

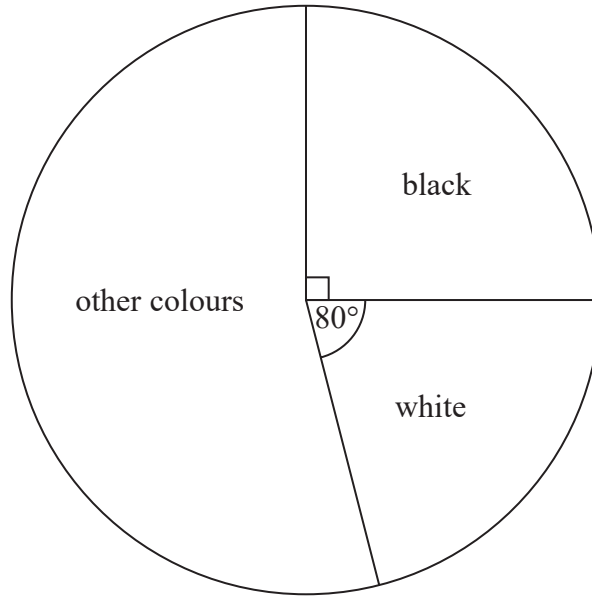
0.62... 0.66... 0.44... 0.60

Typing each fraction into the calculator then formatting them as decimals.
Writing each decimal truncated to 2 decimal places makes them easy to compare

9, 5, 8, 3

(Total for Question 15 is 2 marks)

16 The pie chart gives information about the colour of each car in a car park.



There are 135 black cars in the car park.

(a) Work out the number of white cars in the car park.

$$135 \div 90 \leftarrow \text{Dividing the 135 black cars by the } 90^\circ \text{ which represent them finds that } 1^\circ \text{ represents 1.5 cars}$$

$$1.5 \times 80 \leftarrow \text{Multiplying the value of } 1^\circ \text{ by the } 80^\circ \text{ for white finds that there are 120 white cars}$$

120

(3)

There are 50 grey cars in the car park.

A car in the car park is picked at random.

(b) Find the probability that this car is grey.

$$1.5 \times 360 \leftarrow \text{Multiplying the value of } 1^\circ \text{ by the } 360^\circ \text{ total degrees in the pie chart finds that there are 540 cars in total}$$

50 out of the 540 cars are grey

$\frac{50}{540}$

(2)

(Total for Question 16 is 5 marks)

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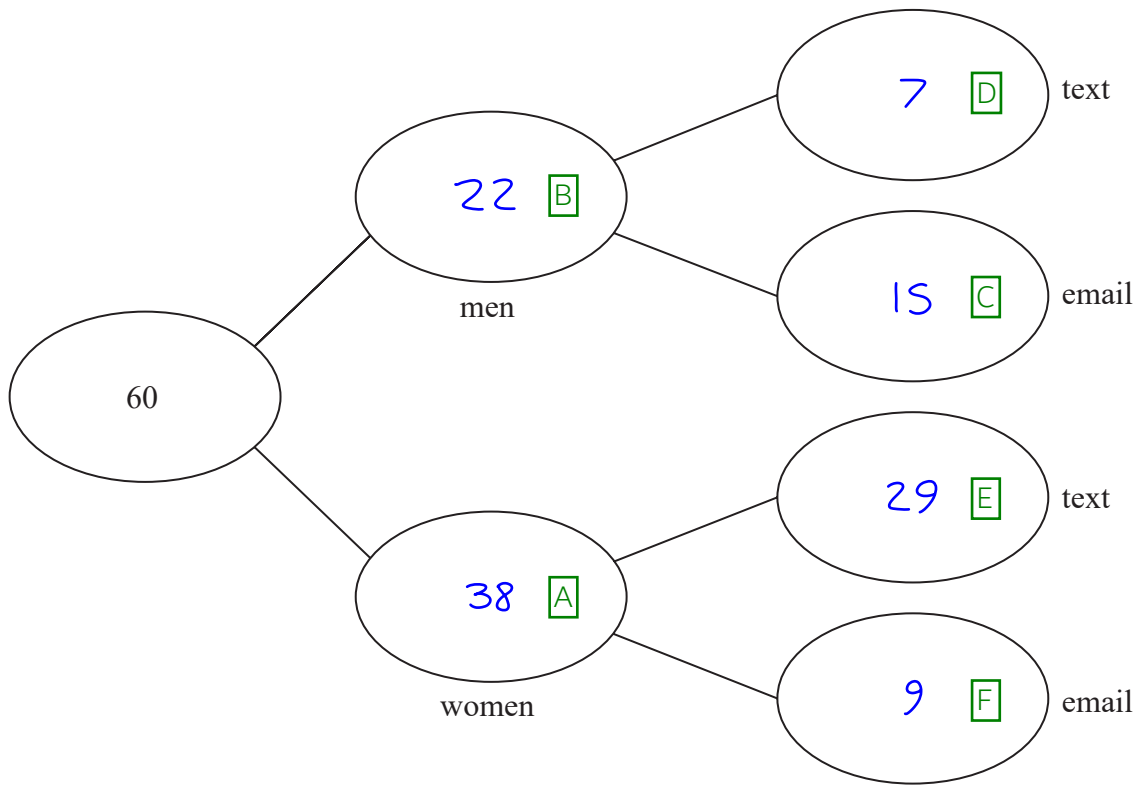
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17 60 people are asked if they prefer to text or to email their friends.

38 of the people are women and the rest are men.
15 of the men prefer to email their friends.
60% of the people prefer to text their friends.

Complete the frequency tree for this information.



- A: 38 of the people are women
- B: The rest of the people are men. $60 - 38 = 22$
- C: 15 of the men prefer to email their friends
- D: The rest of the 22 men must prefer to text. $22 - 15 = 7$
- E: $60\% \times 60 = 36$ so this many prefer to text. $36 - 7 = 29$ so this many women prefer to text
- F: The rest of the women must prefer to email. $38 - 29 = 9$

(Total for Question 17 is 5 marks)

18 The incomplete table gives some information about the lengths of the planks of wood in Ben's workshop.

Length of plank (metres)		Number of planks	
3	×	5	= 15
2.5	×	8	= 20
2			
1.5	×	14	= 21
1	×	10	= 10
			<hr/>
			66

The total length of these planks is 92 metres.

Work out the number of planks of length 2 metres in Ben's workshop.

A: multiplying the lengths of plank by the number of planks finds the total length of all the planks for each category.

B: adding all the totals gives an overall total of 66 metres ignoring the 2 metre planks

$92 - 66$

Subtracting the 66 metre total length of all the planks ignoring the 2 metre planks from the 92 metre total length of all of the planks finds that the total of the 2 metre planks must be 26 metres

$26 \div 2$

Dividing the 26 metre total length of the 2 metre planks by the 2 metres finds that there are 13 planks of length 2 metres

..... 13

(Total for Question 18 is 3 marks)

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19 Rachel, Samina and Tom share £600 between them.

Rachel gets $\frac{2}{5}$ of the £600

Samina gets $\frac{1}{4}$ of the money that is left over.

Tom gets the rest of the money.

Tom says,

“I would have got more money if we had shared the £600 equally between us.”

Is Tom correct?

You must show how you get your answer.

$$600 \div 3 = 200$$

Dividing the £600 by the 3 people finds that Tom would have got £200 if it was shared equally between them

$$\frac{2}{5} \times 600$$

This finds that $\frac{2}{5}$ of the £600 is £240. Of means to multiply

$$600 - 240 = 360$$

Subtracting the £240 Rachel gets from the £600 finds that there is £360 left over

$$\frac{1}{4} \times 360$$

This finds that $\frac{1}{4}$ of the £360 left over is £90. Of means to multiply

$$360 - 90 = 270$$

Subtracting the £90 Samina gets from the £360 left over finds that Tom gets £270

No

Tom gets £270. Tom would get £200 if it was shared equally between them

(Total for Question 19 is 4 marks)

20 (a) Simplify $c^5 \div c^2$

$$a^x \div a^y = a^{x-y}. \text{ So } c^5 \div c^2 = c^{5-2}$$

$$c^3$$

(1)

(b) Simplify $(d^4)^3$

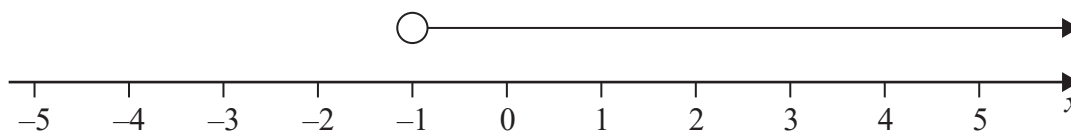
$$(a^x)^y = a^{xy}. \text{ So } (d^4)^3 = d^{4 \times 3}$$

$$d^{12}$$

(1)

(Total for Question 20 is 2 marks)

21 (a) Write down the inequality shown on this number line.

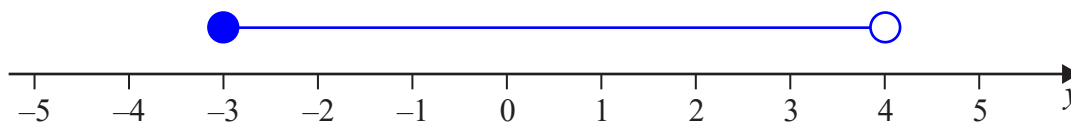


x is greater than -1 as the arrow goes to the right of -1 .
It cannot be equal to -1 as the circle is not shaded in

$$x > -1$$

(1)

(b) On the number line below, show the inequality $-3 \leq y < 4$



Putting circles above -3 and 4 . Shading in the one above -3 as it can be equal. Putting a line between these as y is greater than 3 and less than 4

(2)

(Total for Question 21 is 3 marks)

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22 (a) Find the Highest Common Factor (HCF) of 60 and 84

$2^2 \times 3 \times 5$ ← Using the calculator to express 60 as a product of prime factors

$2^2 \times 3 \times 7$ ← Using the calculator to express 84 as a product of prime factors

$2^2 \times 3$ ← The lowest power of each prime in both lists multiplied together gives the HCF

Newer Casio calculators can work out the HCF without having to do this method

12
(2)

(b) Find the Lowest Common Multiple (LCM) of 24 and 40

$2^3 \times 3$ ← Using the calculator to express 24 as a product of prime factors

$2^3 \times 5$ ← Using the calculator to express 40 as a product of prime factors

$2^3 \times 3 \times 5$ ← The highest power of each prime in both lists multiplied together gives the LCM

Newer Casio calculators can work out the LCM without having to do this method

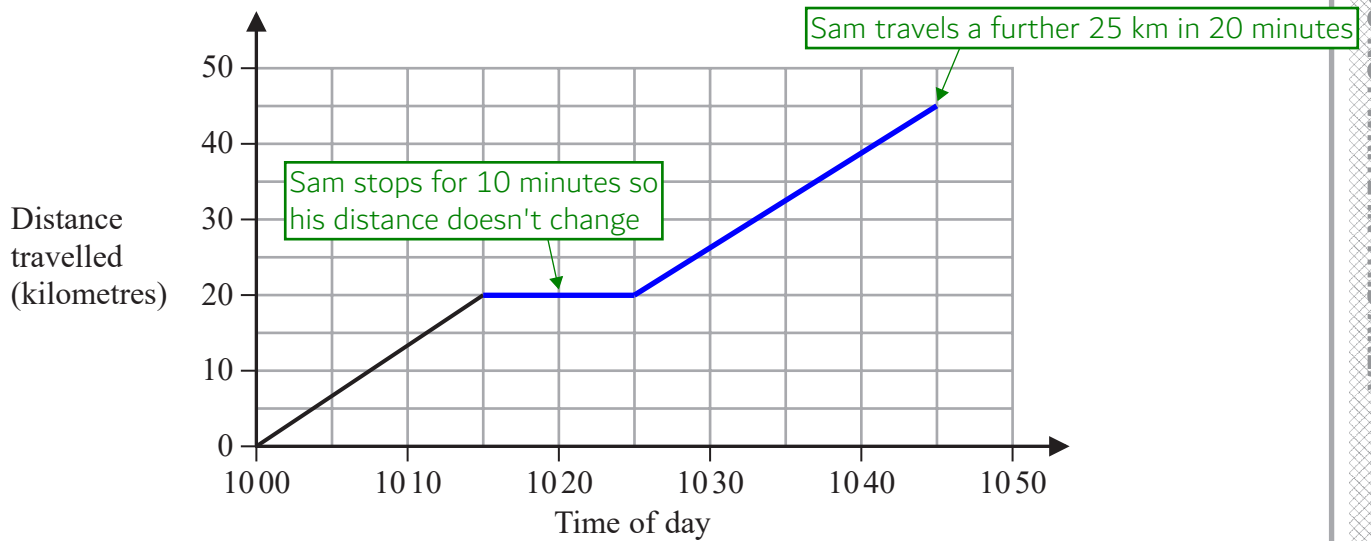
120
(2)

(Total for Question 22 is 4 marks)



23 Sam drives his car on a journey.

Here is the travel graph for the first 15 minutes of his journey.



(a) Work out Sam's speed, in km/h, for the first 15 minutes of his journey.

$$20 \div \frac{15}{60}$$

km/h means to divide the distance travelled in km by the time taken in hours. 20 km is travelled in 15 minutes. There are 60 minutes in an hour so putting the 15 minutes over 60 converts it to hours

..... 80 km/h
(2)

At 1015 Sam stops for 10 minutes and then drives for 20 minutes at a speed of 75 km/h.

(b) On the grid, complete the travel graph for Sam's journey.

$s \begin{matrix} d \\ t \end{matrix}$

Writing a formula triangle for distance, speed, time

$$75 \times \frac{20}{60} = 25$$

Covering d in the formula triangle finds that distance = speed \times time. There are 60 minutes in an hour so putting the 20 minutes over 60 converts it to hours. This needs to be done as hours is involved in km/h

(3)

(Total for Question 23 is 5 marks)



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24 (a) Complete the table of values for $y = x^2 - 2x + 2$

x	-2	-1	0	1	2	3	4
y	10	5	2	1	2	5	10

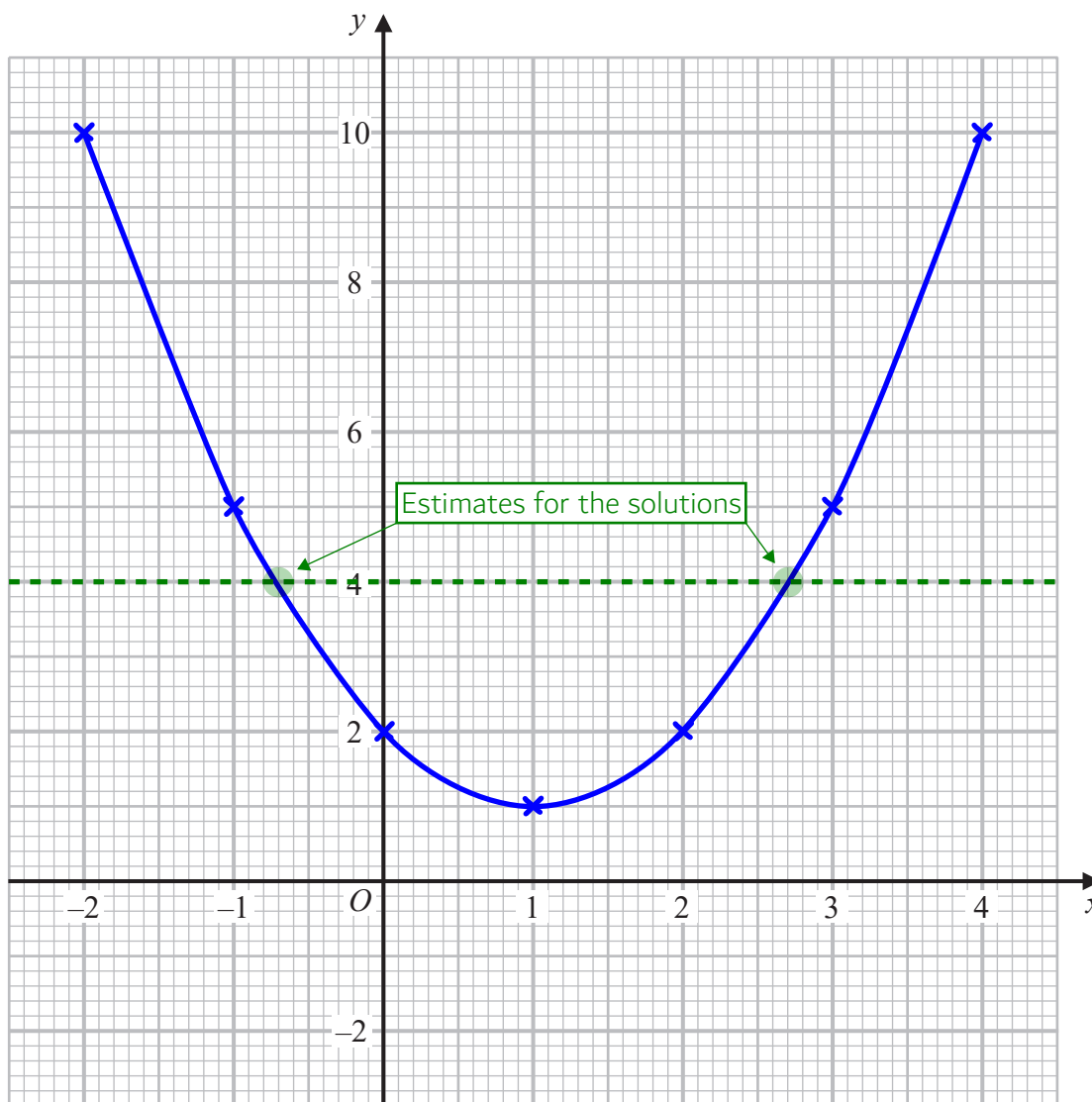
(2)

Using table mode on the calculator. Define $f(x) = x^2 - 2x + 2$. Table range start: -2, end: 4, step: 1

(b) On the grid, draw the graph of $y = x^2 - 2x + 2$ for values of x from -2 to 4

(2)

Plotting the points from the table of values then joining up with a curve



(c) Use your graph to find estimates of the solutions of the equation $x^2 - 2x + 2 = 4$

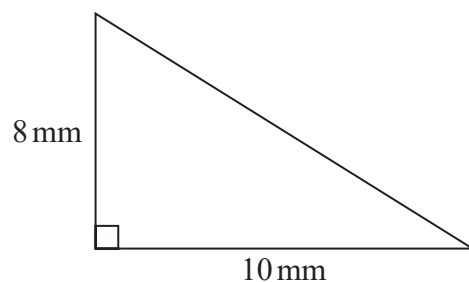
y has been changed to 4. So it is asking what x is when $y = 4$

$x = -0.7$
 $x = 2.7$

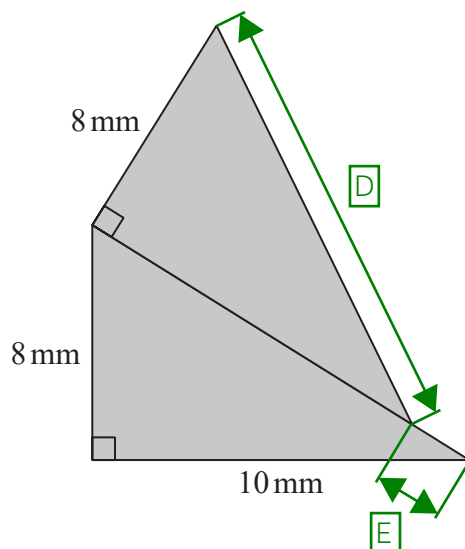
(2)

(Total for Question 24 is 6 marks)

25 Here is a right-angled triangle.



The shaded shape below is made from two of these triangles.



Work out the perimeter of the shaded shape.

Give your answer correct to 3 significant figures.

$$8^2 + 10^2 = c^2 \leftarrow \text{Pythagoras' Theorem can be used to find side D. } a^2 + b^2 = c^2, \text{ where a and b are the shorter sides and c is the longest side}$$

$$c = \sqrt{164} \leftarrow \text{Square rooting both sides get c on its own. So side D is 12.8... cm}$$

$$12.8... - 10 \leftarrow \text{Subtracting the 10 cm from 12.8... cm finds that side E is 2.8... cm}$$

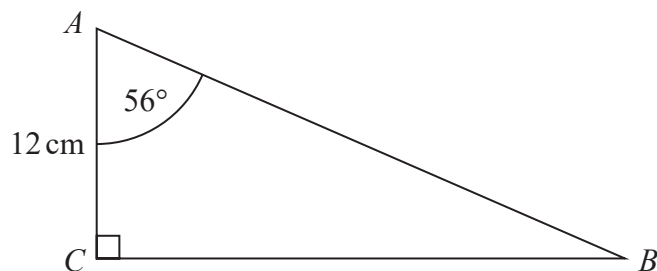
$$10 + 8 + 8 + 12.8... + 2.8... \leftarrow \text{Adding all of the outside sides gives the perimeter}$$

Giving 41.61... to 3 significant figures

..... 41.6 mm

(Total for Question 25 is 4 marks)

26 ABC is a right-angled triangle.



- (a) Work out the length of BC .
Give your answer correct to 1 decimal place.

S O H C A H T O A

Right-angled trigonometry can be used to work out side BC . Ticking A as the 12 cm is the adjacent and O as BC is the opposite. The TOA formula triangle can be used as it has two ticks

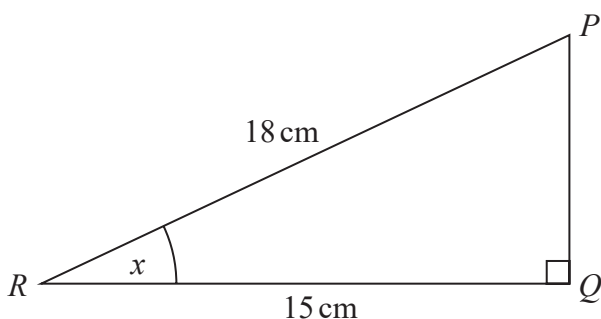
$$\tan 56 \times 12$$

Covering O in the TOA formula triangle finds that opposite = tan of the angle \times adjacent

17.79... is given to 1 decimal place

..... 17.8 cm
(2)

PQR is a right-angled triangle.



- (b) Work out the size of the angle marked x .
Give your answer correct to 1 decimal place.

S O H C A H T O A

Right-angled trigonometry can be used to work out angle x . Ticking H as the 18 cm is the hypotenuse and ticking A as the 15 cm is the adjacent. There are two ticks on the CAH formula triangle so this can be used

$$\cos x = \frac{15}{18}$$

Covering C in the CAH formula triangle finds that cos of the angle = adjacent/hypotenuse

Doing the inverse cos of both sides gets x on its own. 33.55... is given correct to 1 decimal place

..... 33.6 °
(2)

(Total for Question 26 is 4 marks)

27 Solve $x^2 - 7x - 18 = 0$

$(x - 9)(x + 2) = 0$ ← Factorising the left by finding two numbers which multiply to -18 and add to -7 and putting these in brackets with x

As two brackets multiplied equals to 0, one of the two must equal to 0. If $x - 9 = 0$, $x = 9$. If $x + 2 = 0$, $x = -2$

$x = 9$
 $x = -2$

(Total for Question 27 is 3 marks)

28 In a sale, the normal price of a boat is reduced by 15%

The sale price of the boat is £272 000

Work out the normal price of the boat.

$100 - 15$ ← Subtracting the 15% from 100% finds that the sale price is 85% of the normal price

$272000 \div 85$ ← Dividing the sale price by 85 finds that 1% of the normal price is £3200

3200×100 ← Multiplying the value of 1% by 100 finds that the normal price is £320000

£ 320000

(Total for Question 28 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS