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)

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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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 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

3 x 100

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 $12p \div 4$

12/4 = 3

$3p$

(1)

(Total for Question 4 is 2 marks)

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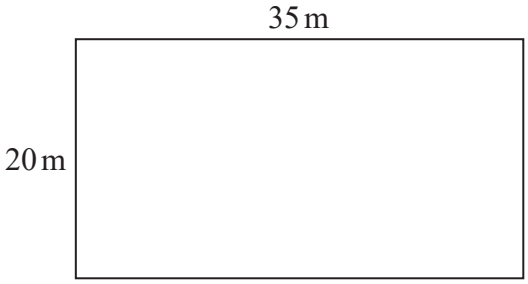
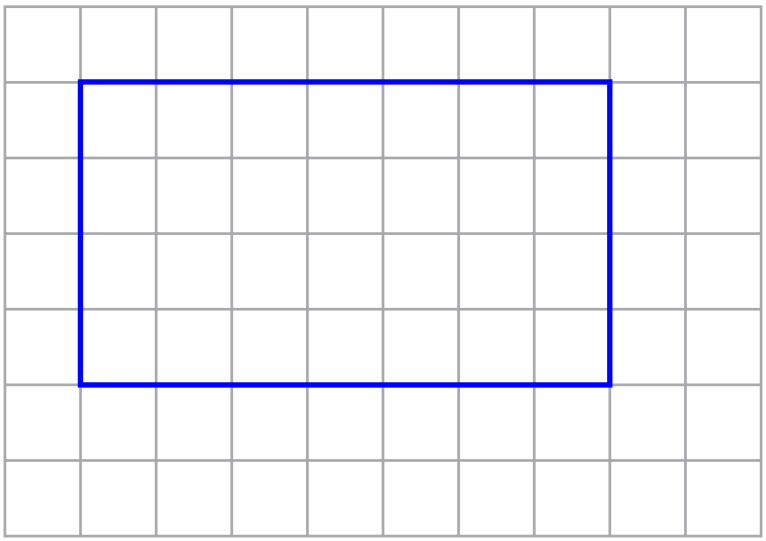
5 The diagram shows a rectangle.



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)

35/5 = 7
20/5 = 4

This works out how many centimetres represent the length and the width

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.

$5^2 = 5 \times 5 = 25$ so it is a square number

25

(1)

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

$3 \times 8 = 24$ 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**.

$\frac{2500-940}{2}$

Subtracting the 940g from the 2500g works out the total mass of flour in both bags A and B. Dividing this by 2 as both bags have the same mass

780 g

(Total for Question 7 is 3 marks)

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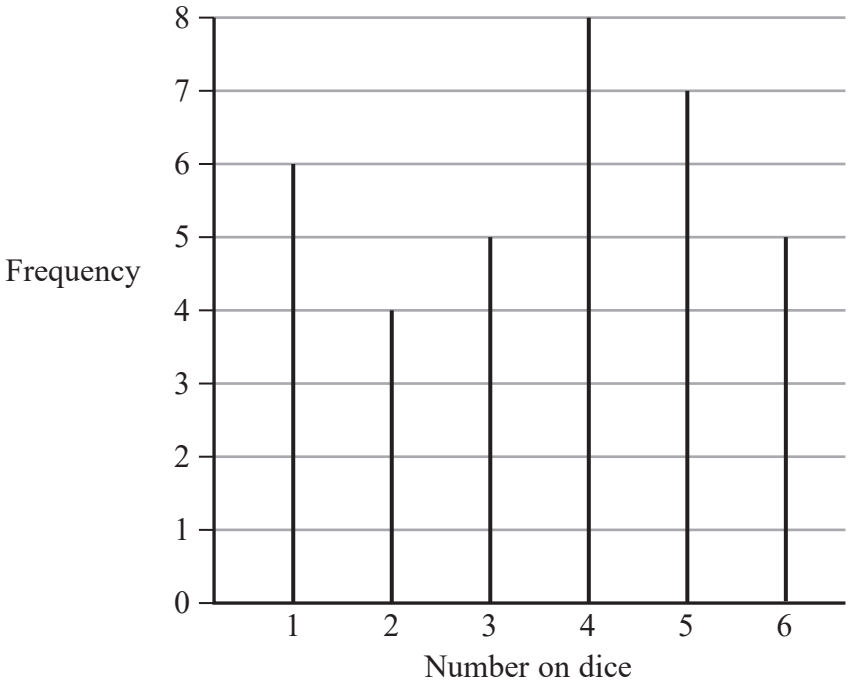
8 5 students throw a dice.
They each throw the dice the same number of times.

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.

$\frac{6+4+5+8+7+5}{5}$

Adding up all of the frequencies works out the total number of times the dice was thrown. Dividing this by the 5 students works out how many lots of 5 it is and therefore how many times each student throws the dice

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 x 4 first

The order of operations, BIDMAS, has not been followed

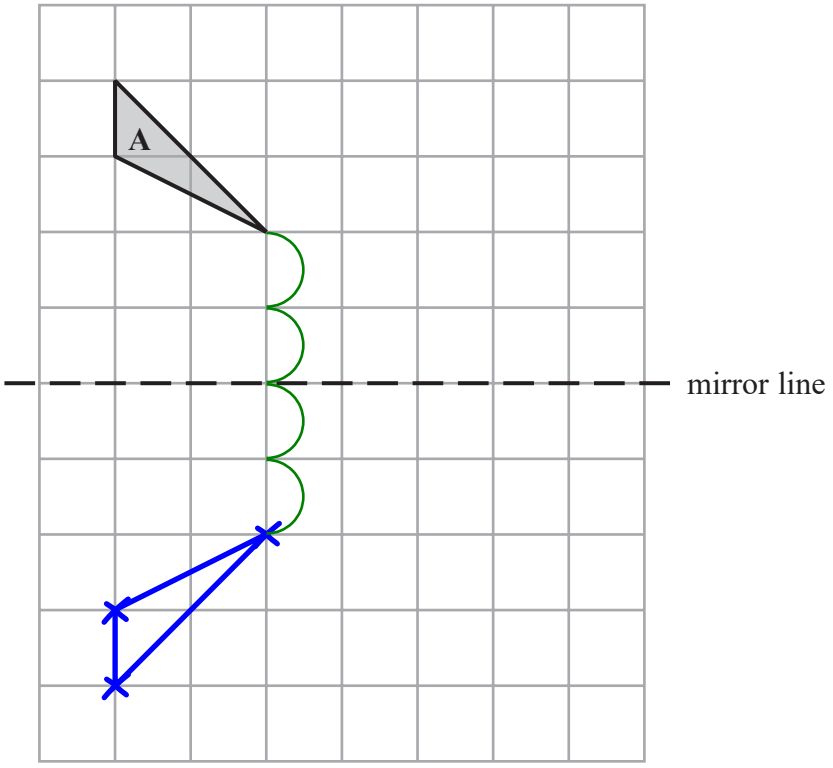
(Total for Question 9 is 1 mark)

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

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

1.84497720S

(2)

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

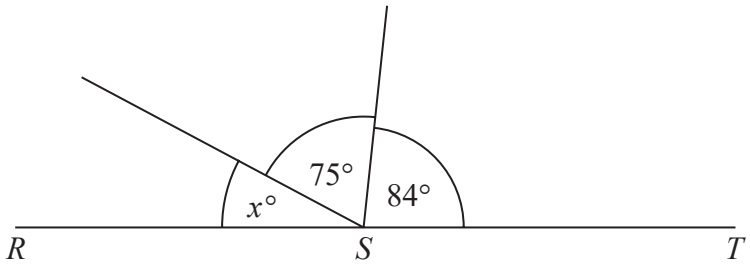
The first 4 is in the second decimal place. The 4 in the next place causes it to round down and everything after the second decimal place is then ignored

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)

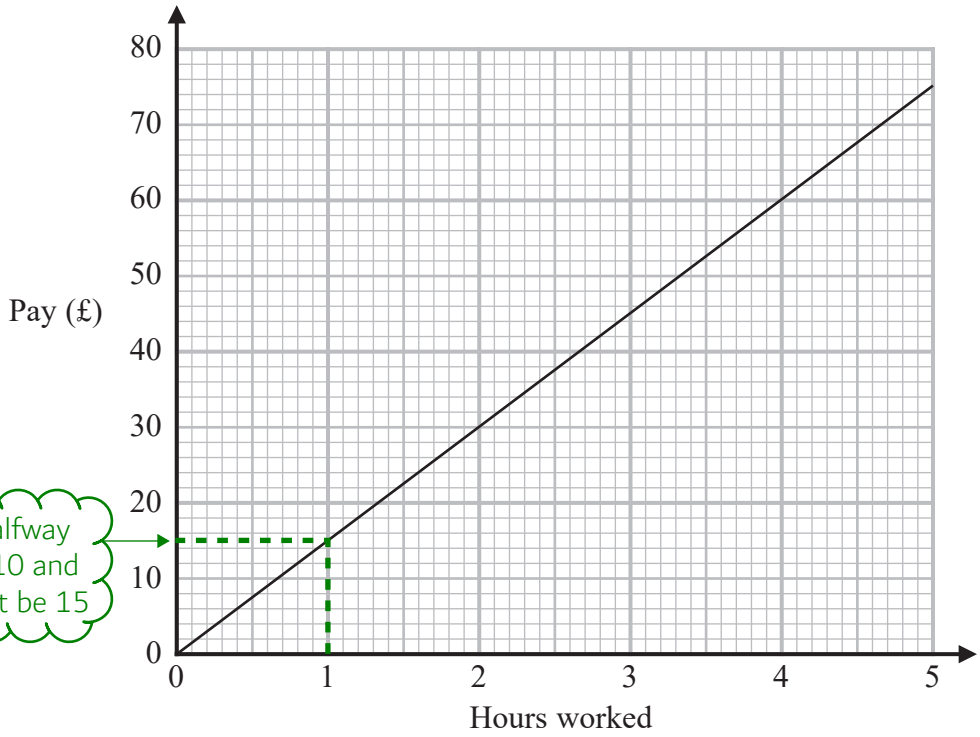
(ii) Give a reason for your answer.

Angles 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

£ 540

(2)

(Total for Question 14 is 3 marks)

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

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

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

Type each fraction into the calculator then convert them into decimals

Writing each decimal to 2 decimal places makes them easy to compare

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

(Total for Question 15 is 2 marks)

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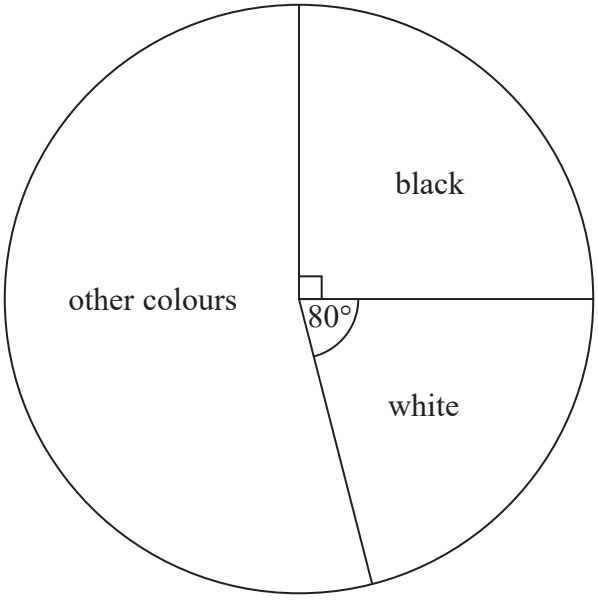
16 The pie chart gives information about the colour of each car in a car park.



There are 135 black cars in the car park.

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

$\frac{135}{90} \times 80$ ← 90° represent 135 cars. Dividing the 135 by the 90 works out what each degree represents. Multiplying this by the 80 works out what 80° represent, and therefore how many white cars there were

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.

$\frac{135}{90} \times 360$ ← 90° represent 135 cars. Dividing the 135 by the 90 works out what each degree represents. Multiplying this by 360 works out what 360° represent, and therefore how many cars there are in total

50 out of the total of 540 cars were grey → $\frac{50}{540}$

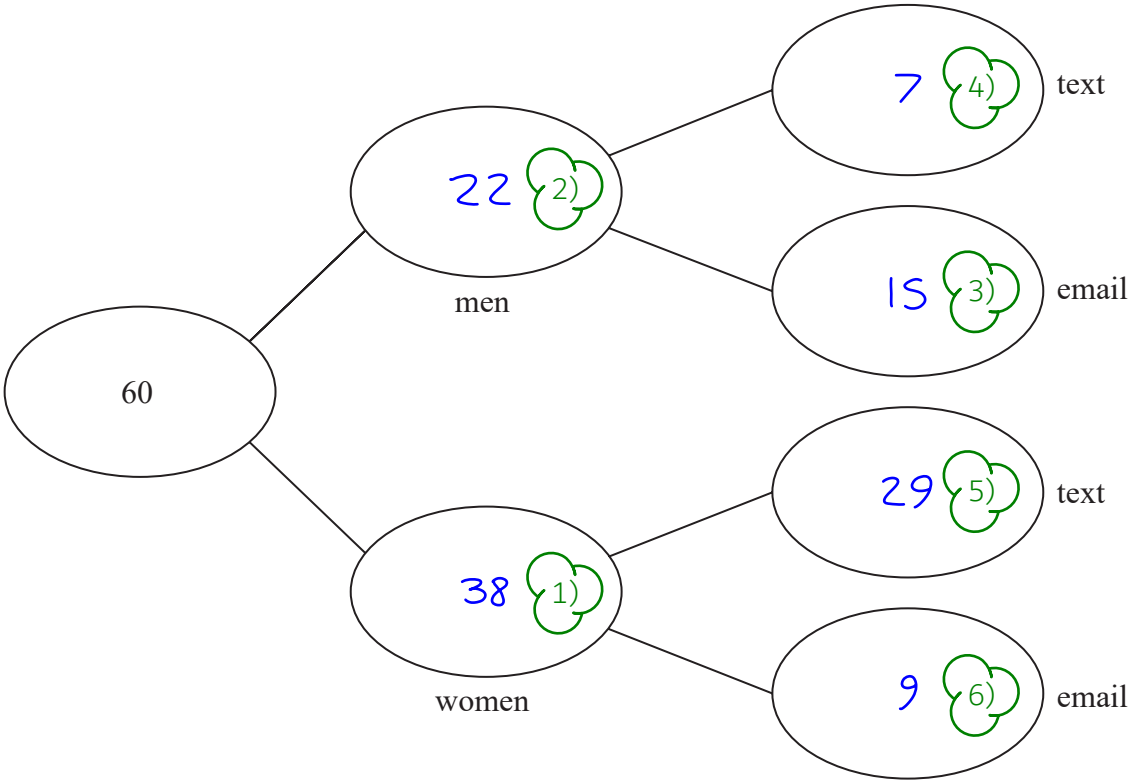
(2)

(Total for Question 16 is 5 marks)

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.



1) 38 of the people are women
2) The rest of the people are men. 60 - 38 = 22
3) 15 of the men prefer to email their friends
4) The rest of the 22 men must prefer to text. 22 - 15 = 7
5) 60% x 60 = 36 so this many prefer to text. 36 - 7 = 29 so this many women prefer to text
6) 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
2.5	8
2	
1.5	14
1	10

The total length of these planks is 92 metres.

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

$\frac{92-3\times5-2.5\times8-1.5\times14-1\times10}{2}$

Multiplying the length of each plank by the number of planks of that length works out the total length of all of the planks of that length. Subtracting all of these totals from the 92 metres works out the total length of the 2m planks. Dividing this by 2 works out how many lots of 2m the total is and therefore the number of planks of length 2m

13

(Total for Question 18 is 3 marks)

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.

$\frac{3}{4} \times \frac{3}{5} \times 600 - \frac{600}{3} = 70$

This works out how much money Tom gets. He gets 3/4 of 3/5 of the £600. 'Of' means to multiply. As Samina gets 1/4 of what is left over, Tom gets 3/4 as 1 - 1/4 = 3/4. As Rachel gets 2/5, there is 3/5 left over as 1 - 2/5 = 3/5

This works out how much money Tom would get if the £600 was shared equally between them

No ← Subtracting the amount of money Tom would get from the amount he does get gives a positive result so the amount he does get must be more

(Total for Question 19 is 4 marks)

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

$a^x / a^y = a^{x-y}$

c^3

.....

(1)

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

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

d^{12}

.....

(1)

(Total for Question 20 is 2 marks)

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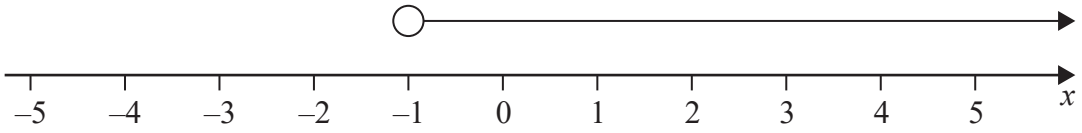
21 (a) Write down the inequality shown on this number line.



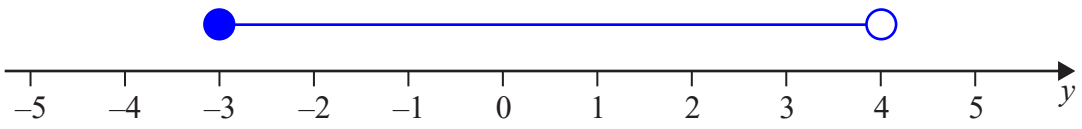
x is greater than -1 as the arrow goes to the right of -1.
It cannot be equal to -1 as the circle is not shaded in

$x > -1$

.....

(1)

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



(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

If using a Casio fx-85GT CW, go to CATALOG, Numeric Calc then GCD. GCD(60 , 84) = 12

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

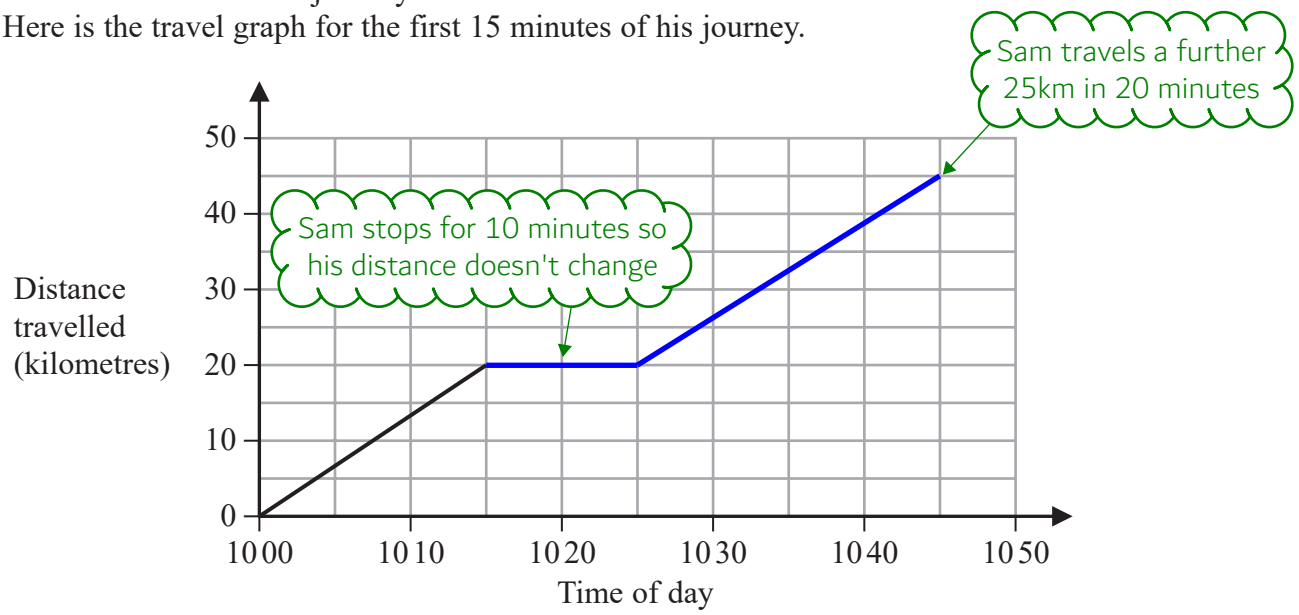
If using a Casio fx-85GT CW, go to CATALOG, Numeric Calc then LCM. LCM(24 , 40) = 120

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.

S d t ← Quoting the formula triangle for distance, speed and time

20 / 0:15 ← From the formula triangle, speed = distance/time. The distance is 20km and the time is 15 minutes. Time can be entered into the calculator using the °''' button

80 km/h

(2)

At 10 15 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.

75 × 0:20 = 25 ← From the formula triangle, distance = speed x time. The speed is 75km/h and the time is 20 minutes. Time can be entered into the calculator using the °''' button

(3)

(Total for Question 23 is 5 marks)

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

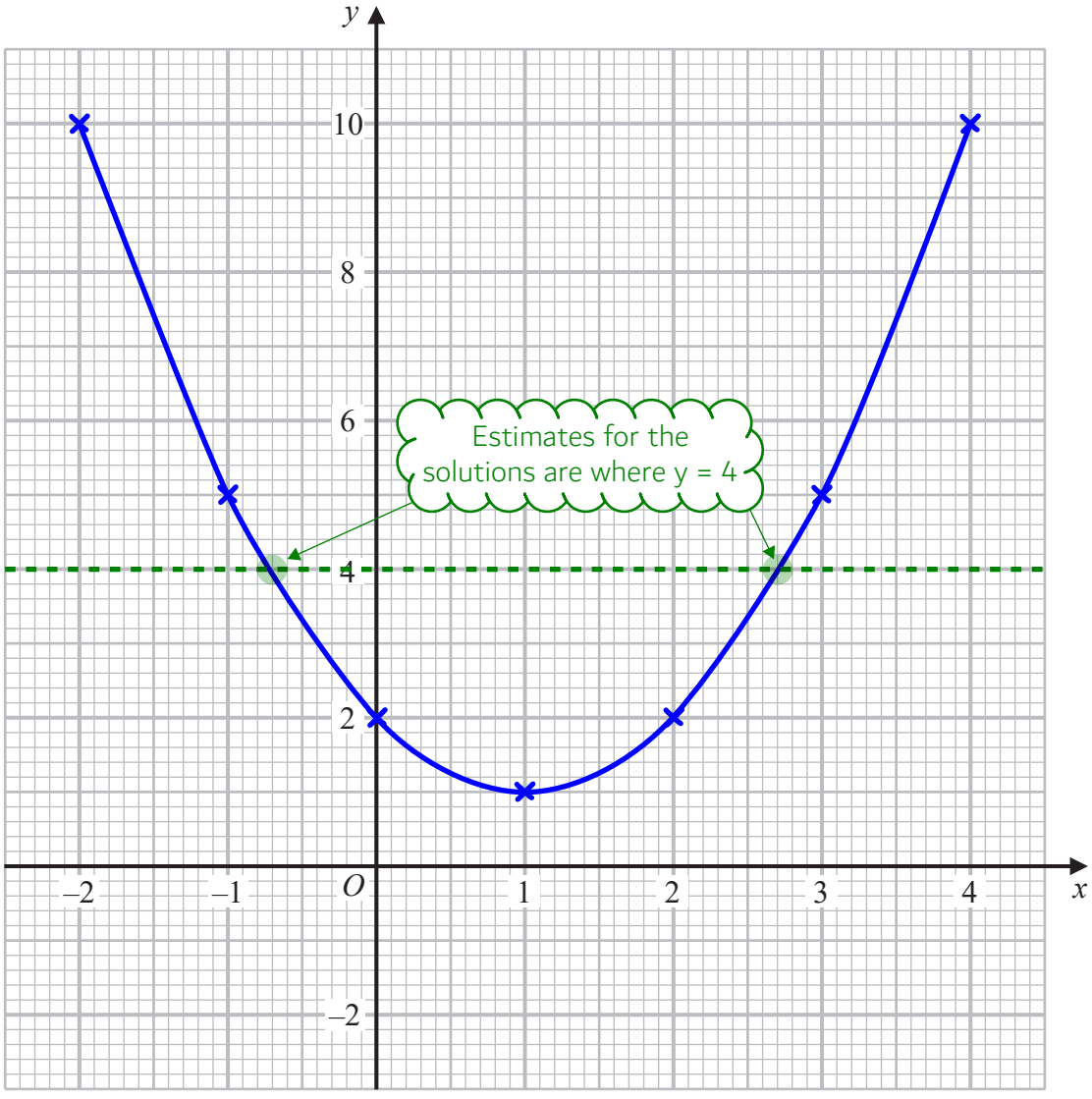
x	–2	–1	0	1	2	3	4
y	10	5	2	1	2	5	10

(2)

Use table mode. Define f(x) = x² - 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)



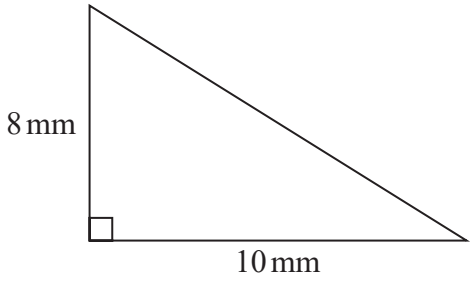
(c) Use your graph to find estimates of the solutions of the equation $x^2 - 2x + 2 = 4$

$x = -0.7$
$x = 2.7$

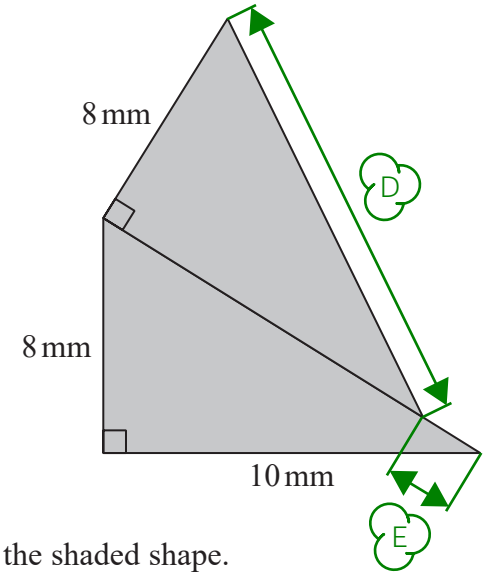
(2)

(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.

$a^2+b^2=c^2$ ← Pythgoras' Theorem can be used to work out the longest side of the right angled traingle

$c=\sqrt{a^2+b^2}$ ← c is the longest side so rearranged to make this the subject

$=\sqrt{10^2+8^2}$ ← Substituted a for 10 and b for 8

$10+8+8+2\sqrt{41}+(2\sqrt{41}-10)$ ← Perimeter is all of the outside edges added together

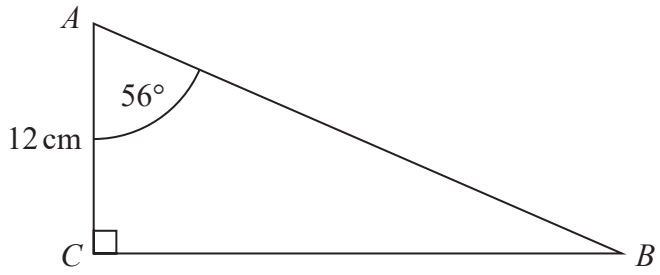
Side D: $2\sqrt{41}$ Side E: $(2\sqrt{41}-10)$

The answer is quoted as a decimal 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.

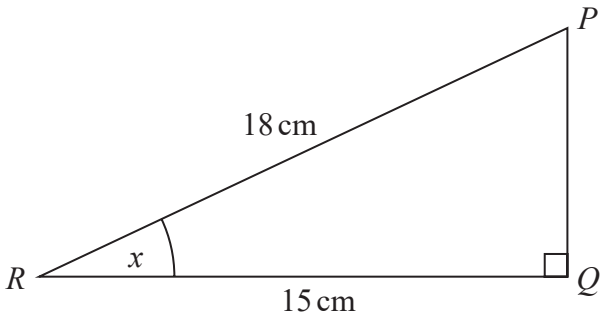
SOH CAH TOA ← Right angled trigonometry can be used to work out side BC. Ticking A as we have the adjacent and O as we are looking for the opposite. The tan formula can be used as it has two ticks

tan 56 × 12 ← From the tan formula triangle, opposite = tan of the angle x adjacent

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.

SOH CAH TOA ← Right angled trigonometry can be used to work out angle x. Ticking H and A as we have the hypotenuse and the adjacent. The cos formula can be used as it has two ticks

$\cos^{-1}\left(\frac{15}{18}\right)$ ← From the formula triangle, cos of the angle = adjacent/hypotenuse. So angle = $\cos^{-1}$(adjacent/hypotenuse)

33.6 °

(2)

(Total for Question 26 is 4 marks)

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

$(x-9)(x+2)=0$ ← Factorised 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.

$\frac{272000}{100-15} \times 100$ ← The normal price is 100%. Subtracting 15 works out the percentage it is reduced to. Dividing the sale price by this works out 1%. Multiplying this by 100 works out the normal price

£ 320000

(Total for Question 28 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS