

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)

Thursday 6 June 2019

Morning (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.
- 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

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1 Write 0.75 as a fraction.

Type into the calculator

$$\frac{3}{4}$$

(Total for Question 1 is 1 mark)

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

-3 4 0 -1 2

Negative numbers are smaller than positive numbers. The more negative it is, the smaller it is

-3, -1, 0, 2, 4

(Total for Question 2 is 1 mark)

- 3 Write down two factors of 15

$1 \times 15 = 15$, so both 1 and 15 are factors of 15

1, 15

(Total for Question 3 is 1 mark)

- 4 Change 1756 grams to kilograms.

1 kilogram = 1000 grams. So dividing the 1756 grams by 1000 converts it to kilograms

1.756 kg

(Total for Question 4 is 1 mark)

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5 Write the number two million in figures.

2000000

(Total for Question 5 is 1 mark)

6 Dave goes into a cafe and buys 2 cups of coffee and a piece of cake.

Each cup of coffee costs £2.75

The cake costs £2.90

Dave pays with a £10 note.

He thinks he will get more than £1.50 in change.

Is Dave correct?

You must show how you get your answer.

2.75×2 ← Multiplying the cost of each coffee by 2 works out that the cost of 2 coffees is £5.50

$5.50 + 2.90$ ← Adding the cost of the cake to the cost of the 2 coffees works out that the total cost is £8.40

$10 - 8.40 = 1.60$ ← Subtracting the total cost from the £10 paid works out that £1.60 too much was paid, so this is the change

Yes ← £1.60 change is more than £1.50 change

(Total for Question 6 is 3 marks)

- 7 There are y boats on a lake.
There are 7 people in each boat.

Write an expression, in terms of y , for the total number of people in the boats.

There are y lots of 7 people in total in the boats. Multiplying y by 7 gives $7y$

$7y$

(Total for Question 7 is 1 mark)

- 8 (a) Simplify $a \times b \times 7$

They can be multiplied in any order. Writing them next to each other means to multiply. The number should be written before the letters

$7ab$

(1)

- (b) Simplify $y \times y \times y$

Three y multiplied together is y to the power of 3

y^3

(1)

- (c) Simplify fully $\frac{e \times e \times e \times f}{e \times e \times f \times f}$

Cancelling out common factors from the numerator and denominator

$\frac{e}{f}$

(2)

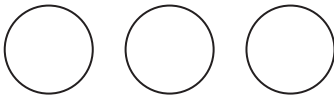
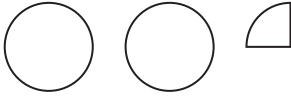

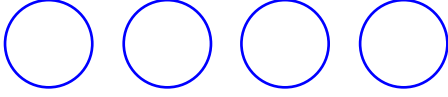
(Total for Question 8 is 4 marks)

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- 9 The pictogram shows information about the number of vinyl records sold in a shop on Monday and on Tuesday.

Monday	
Tuesday	
Wednesday	
Thursday	

Key:



represents
8 vinyl records

- (a) Write down the number of vinyl records sold

- (i) on Monday,

There are 3 full circles and each one represents 8 vinyl records. $3 \times 8 = 24$

24

(1)

- (ii) on Tuesday.

$2\frac{1}{4} \times 8 = 18$

18

(1)

On Wednesday and Thursday a total of 36 vinyl records were sold.

The number of records sold on Thursday was 8 times the number of records sold on Wednesday.

- (b) Use this information to complete the pictogram.

$1 : 8$ ← The ratio of Wednesday to Thursday is $1 : 8$

$36 \div 9 = 4$ ← $1 + 8 = 9$ parts in total which represent the 36 vinyl records. Dividing the 36 by the 9 parts works out that 1 part of the ratio is worth 4, which is how many were sold on Wednesday

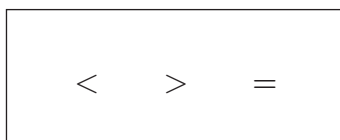
$4 \times 8 = 32$ ← Multiplying the value of 1 part by 8 works out that 32 were sold on Thursday

$4 \div 8 = \frac{1}{2}$
 $32 \div 8 = 4$ ← Dividing the numbers sold on each day by the 8 which each symbol represents works out how many symbols should be drawn

(3)

(Total for Question 9 is 5 marks)

10 Here are three symbols.



Write one of these symbols in each box to make four true statements.

$$14 \quad \boxed{<} \quad 21 \quad \leftarrow \quad \boxed{14 \text{ is less than } 21}$$

$$11 = 4 + 7 \quad \boxed{=} \quad 103 - 92 = 11 \quad \leftarrow \quad \boxed{\text{Both are equal as they are both } 11}$$

$$4 = 2^2 \quad \boxed{=} \quad 2 \times 2 = 4 \quad \leftarrow \quad \boxed{\text{Both are equal as they are both } 4}$$

$$-3 \quad \boxed{>} \quad -5 \quad \leftarrow \quad \boxed{-3 \text{ is greater than } -5}$$

(Total for Question 10 is 2 marks)

11 $P = 7r + 3q$

Work out the value of P when $r = 5$ and $q = -4$

$$7(5) + 3(-4) \quad \leftarrow \quad \boxed{\text{Substituting } 5 \text{ for } r \text{ and } -4 \text{ for } q}$$

23

(Total for Question 11 is 2 marks)

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12 Here is part of a train timetable.

Brighton	07 22	07 29	07 32
London	09 00	08 32	08 48

Graham gets to the station in Brighton at 07 15

(a) Work out how many minutes he has to wait until 07 22

22 - 15

As the hours are the same in both times, the minutes can be subtracted to work out the difference in time

.....7..... minutes
(1)

(b) Work out how long it will take the 07 22 train to get to London.

09°00° - 07°22°

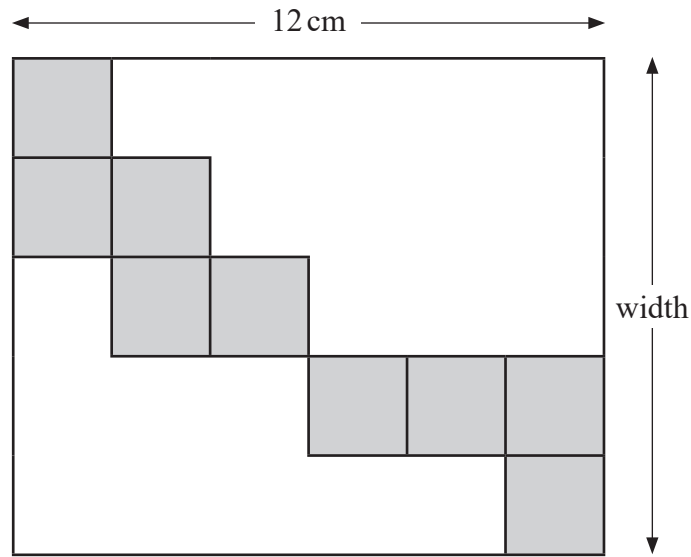
The 07 22 train gets to London at 09 00. Entering the times as sexagesimals on the calculator and subtracting them works out the difference in time

1°38'0" can be read as 1 hour 38 minutes

.....1 hour 38 minutes.....
(2)

(Total for Question 12 is 3 marks)

13 The diagram shows nine identical squares inside a rectangle.



The length of the rectangle is 12 cm.

Work out the width of the rectangle.

$$12 \div 6$$

The rectangle is 6 squares long. So dividing the length of the rectangle by 6 works out that the length of each square is 2 cm

$$2 \times 5$$

The rectangle is 5 squares wide. So multiplying the length of each square by 5 works out the width of the rectangle

.....10.....cm

(Total for Question 13 is 3 marks)

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14 Write the ratio 4.5 : 2.25 in the form $n : 1$

$4.5 \div 2.25$ ← The 2.25 is divided by 2.25 to get 1 so 4.5 also needs to be divided by 2.25

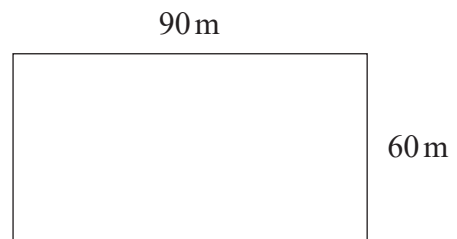
2 : 1

(Total for Question 14 is 1 mark)

15 A garden is in the shape of a rectangle 90 m by 60 m.

Flowers are grown in 40% of the garden.
The rest of the garden is grass.

Work out the area of the garden that is grass.



$100 - 40 = 60$ ← Subtracting the 40% which is flowers from 100% works out that 60% is grass

90×60 ← Area of rectangle = length \times width. So the area of the garden is 5400 m²

$\frac{60}{100} \times 5400$ ← Putting 60% over 100 converts it to a fraction. Multiplying this fraction by the area of the garden works out that 60% of the area of the garden is 3240 m², which is the area that is grass

3240 m²

(Total for Question 15 is 4 marks)

16 Four biased coins, A, B, C and D are thrown.

The probability that each coin will land on Heads is shown in the table.

Coin	Probability
A	0.33
B	0.033
C	$\frac{1}{3} = 0.\dot{3}$
D	30% = 0.3

Converting the fraction to a decimal using the calculator

Converting the percentage to a decimal by dividing it by 100

(a) (i) Which coin is least likely to land on Heads?

0.033 is the smallest probability

B

(1)

(ii) Which coin is most likely to land on Heads?

$\frac{1}{3}$ is the greatest probability

C

(1)

Julie says,

“The probability that coin C will land on Heads is the same as the probability that coin C will land on Tails.”

(b) Is she correct?

Give a reason for your answer.

No as the probability for heads is $\frac{1}{3}$ and tails is $\frac{2}{3}$

It is certain that the coin will either be heads or tails so both probabilities will add up to 1. So subtracting the probability of getting heads from 1 leaves the probability of getting tails

(1)

Coin B is going to be thrown 4000 times.

(c) Work out an estimate for the number of times coin B will land on Heads.

$$0.033 \times 4000$$

The probability is an estimate of the relative frequency so multiplying this by the number of times it is thrown gives the estimate of the times it will land on heads

132

(2)

(Total for Question 16 is 5 marks)

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17 There are 84 calories in 100 g of banana.
There are 87 calories in 100 g of yogurt.

Priti has 60 g of banana and 150 g of yogurt for breakfast.

Work out the total number of calories in this breakfast.

$84 \div 100$

Dividing the 84 calories by the 100 g of banana works out that 1 g of banana has 0.84 calories

$0.84 \times 60 = 50.4$

Multiplying the calories in 1 g of banana by 60 works out that there is 50.4 calories in 60 g of banana

$87 \div 100$

Dividing the 87 calories by the 100 g of yogurt works out that 1 g of yogurt has 0.87 calories

$0.87 \times 150 = 130.5$

Multiplying the calories in 1 g of yogurt by 150 works out that there is 130.5 calories in 150 g of yogurt

$50.4 + 130.5$

Adding the 50.4 calories in the 60 g of banana and the 130.5 calories in the 150 g of yogurt works out the total number of calories

.....180.9

(Total for Question 17 is 4 marks)

18 Machine A and machine B both make car parts.

Machine A makes 6 parts every 10 minutes.

Machine B makes 13 parts every 15 minutes.

On Monday

machine A makes parts for 12 hours

machine B makes parts for 10 hours

Work out the total number of parts made by the two machines on Monday.

12×60 ← 1 hour = 60 minutes. So multiplying the 12 hours by 60 converts it to 720 minutes

$720 \div 10$ ← Dividing the 720 minutes by the 10 minutes works out that there are 72 lots of 10 minutes in 12 hours

$72 \times 6 = 432$ ← Doing 72 lots of the 6 parts works out that machine A makes 432 parts in 12 hours

10×60 ← 1 hour = 60 minutes. So multiplying the 10 hours by 60 converts it to 600 minutes

$600 \div 15$ ← Dividing the 600 minutes by the 15 minutes works out that there are 40 lots of 15 minutes in 10 hours

$40 \times 13 = 520$ ← Doing 40 lots of the 13 parts works out that machine B makes 520 parts in 10 hours

$432 + 520$ ← Adding the 432 parts made by machine A and the 520 parts made by machine B works out the total amount of parts made

.....952

(Total for Question 18 is 4 marks)

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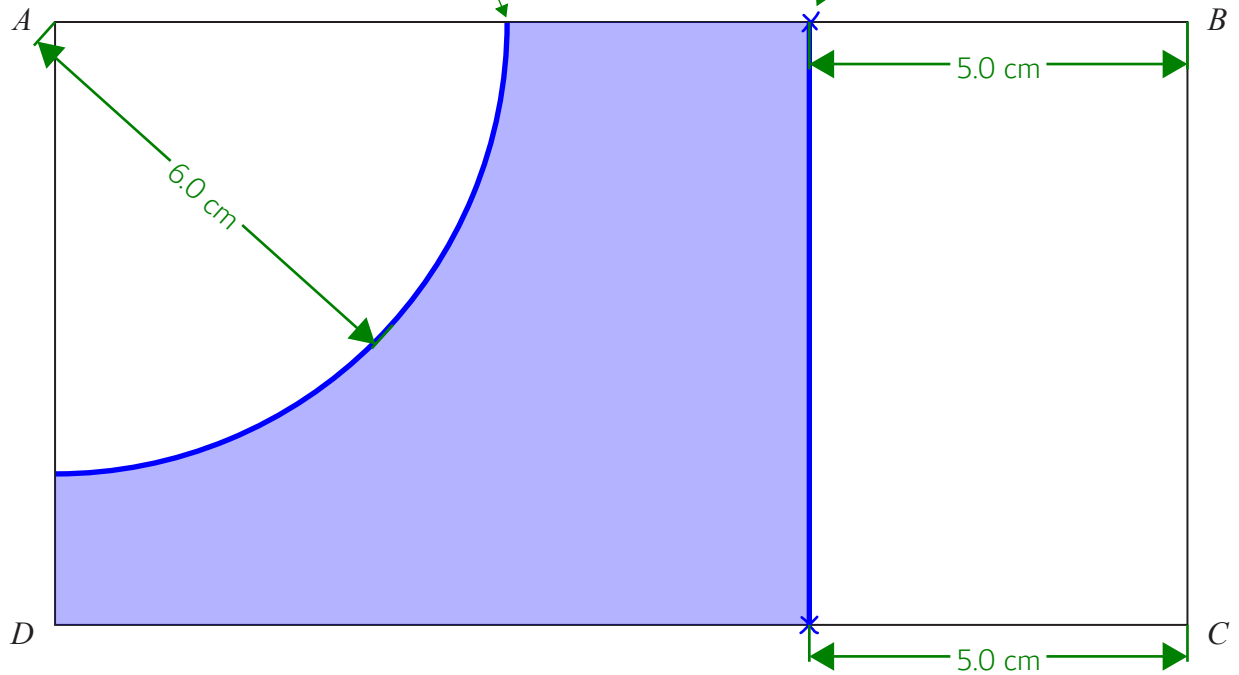
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19 Here is a plan of a kitchen drawn to a scale of 1 : 30

Using a compass to scribe an arc with radius 6 cm to show all points which are exactly 6 cm away from A

Using a ruler to mark 5 cm to the left from points B and C then join up the two crosses with a straight line



Scale 1:30 ← Every 30 units of length in the real world is 1 unit on the diagram

Sam is going to put a small table in the kitchen.

The table has to be

more than 180 cm from A

more than 150 cm from BC

$$180 \div 30 = 6$$

$$150 \div 30 = 5$$

Dividing by 30 works out how many lots of 30 each is and so converts the lengths into what is needed on the diagram

Show, by shading on the diagram, the region where Sam can put the table.

(Total for Question 19 is 4 marks)

20 (a) Solve $14n > 11n + 6$

$3n > 6$ ← Subtracting $11n$ from both sides gets all the n on the same side

Dividing both sides by 3 gets n on its own

$n > 2$

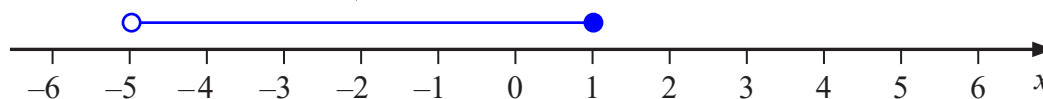
(2)

(b) On the number line below, show the set of values of x for which $-2 < x + 3 \leq 4$

$-5 < x \leq 1$

Closed circle means that the value is included in the set. Open circle means the value isn't included. A line is drawn over the values included between the circles

Subtracting 3 from all sides of the inequality gets x on its own



(3)

(Total for Question 20 is 5 marks)

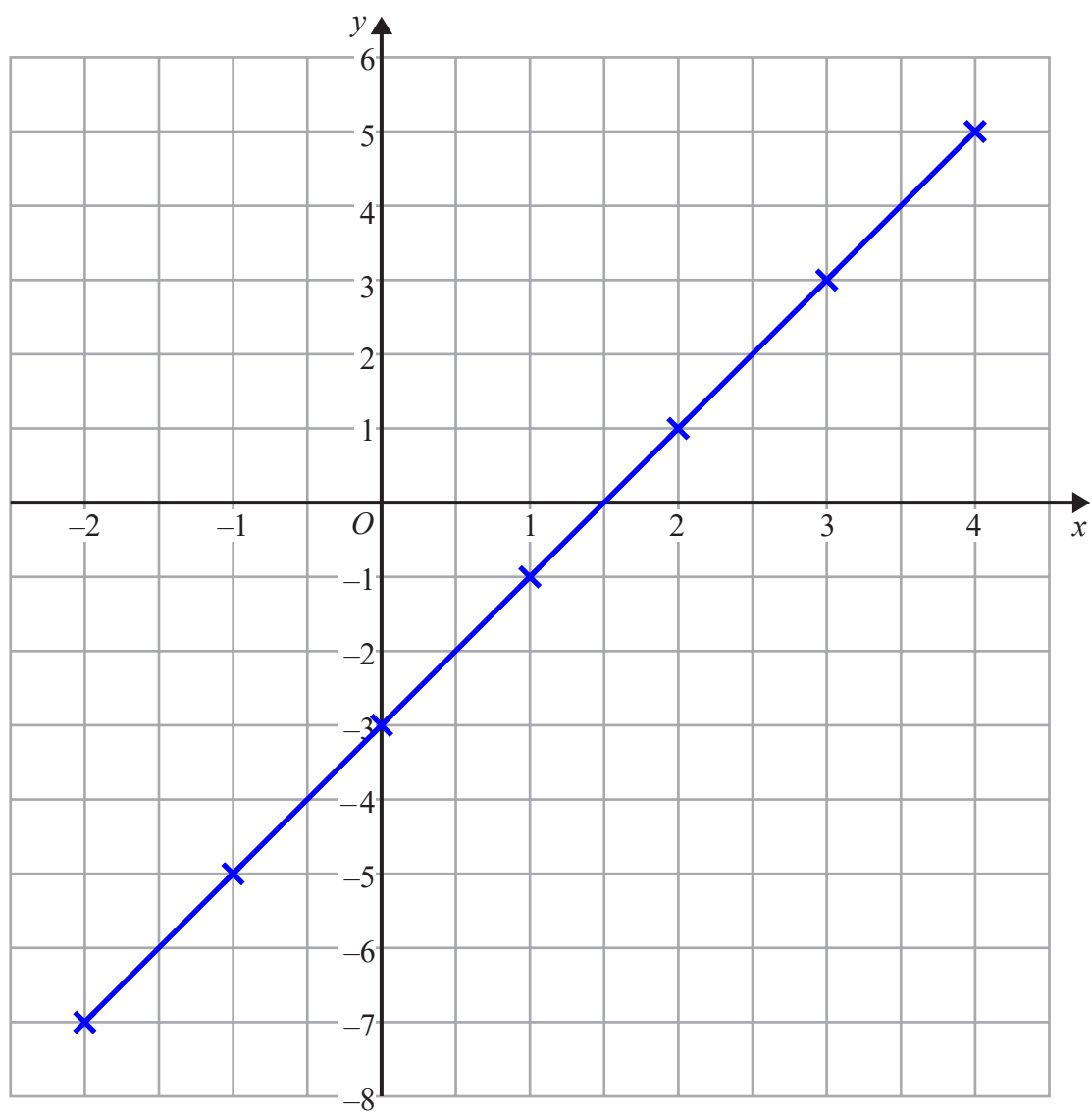
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21 On the grid below, draw the graph of $y = 2x - 3$ for values of x from -2 to 4

Using table mode on the calculator. Define $f(x) = 2x - 3$. Start: -2 . End: 4 . Step: 1 . This gives a table of values. Plotting the points then joining up with a straight line



(Total for Question 21 is 3 marks)

22 Hannah is planning a day trip for 195 students.

She asks a sample of 30 students where they want to go.
Each student chooses one place.

The table shows information about her results.

Place	Number of students
Theme Park	10
Theatre	5
Sports Centre	8
Seaside	7

(i) Work out how many of the 195 students you think will want to go to the Theme Park.

$$\frac{10}{30} \times 195$$

10 out of the 30 in the sample chose the Theme Park so estimating that there will be this fraction of the total students

65
(2)

(ii) State any assumption you made **and** explain how this may affect your answer.

The sample was representative. The answer could be different

10/30 of the sample chose Theme Park but this may not be the fraction of the 195 students who will want to go to the Theme Park

(1)

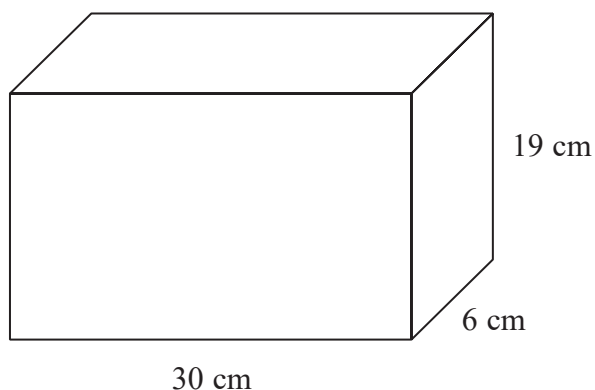
(Total for Question 22 is 3 marks)

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23 A container is in the shape of a cuboid.



The container is $\frac{2}{3}$ full of water.

A cup holds 275 ml of water.

What is the greatest number of cups that can be completely filled with water from the container?

$30 \times 6 \times 19$ ← Volume of cuboid = length \times width \times height. So the volume of the container is 3420 cm^3

$\frac{2}{3} \times 3420$ ← Doing $\frac{2}{3}$ of the volume of the container works out that 2280 cm^3 is full of water

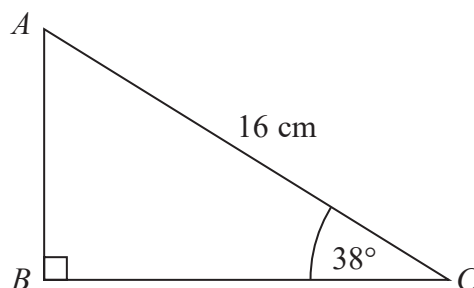
$2280 \div 275$ ← $1 \text{ cm}^3 = 1 \text{ ml}$. So the volume of the water is 2280 ml. Dividing this by the 275 ml in each cup works out how many cups can be filled

8.2... is rounded down to 8 as it is asking for cups that are completely filled and 9 is too many

8

(Total for Question 23 is 4 marks)

24 ABC is a right-angled triangle.



Calculate the length of AB .

Give your answer correct to 2 decimal places.

SOHCAHTOA

Using right-angled trigonometry. Ticking O as AB is the opposite and ticking H as the 16 cm is the hypotenuse. There are two ticks on the SOH formula triangle so this one can be used

$$\sin 38 \times 16$$

Covering O finds that opposite = sin of the angle \times hypotenuse

$$\dots\dots\dots 9.85 \dots\dots\dots \text{cm}$$

(Total for Question 24 is 2 marks)

25 Sally used her calculator to work out the value of a number y .

The answer on her calculator display began

8.3

Complete the error interval for y .

The number is truncated (not rounded). The smallest it can be and truncate to 8.3 is 8.3. The smallest it could be to truncate to 8.4 is 8.4, so 8.4 is too high and it must be less than this

$$\dots\dots\dots 8.3 \dots\dots\dots \leq y < \dots\dots\dots 8.4 \dots\dots\dots$$

(Total for Question 25 is 2 marks)

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26 £360 is shared between Abby, Ben, Chloe and Denesh.

The ratio of the amount Abby gets to the amount Ben gets is 2:7

Chloe and Denesh each get 1.5 times the amount Abby gets.

Work out the amount of money that Ben gets.

2×1.5 ← Abby gets 2 parts. Multiplying this by 1.5 works out that Chloe and Denesh each get 3 parts

$2 : 7 : 3 : 3$ ← Writing the ratio of Abby : Ben : Chloe : Denesh

$2 + 7 + 3 + 3$ ← This works out that there are 15 parts in total in the ratio

$360 \div 15$ ← The total of £360 is represented by 15 parts of the ratio. So dividing the £360 by 15 works out that 1 part of the ratio is worth £24

24×7 ← Multiplying the value of 1 part of the ratio by the 7 parts which represent Ben works out the amount of money that Ben gets

£..... 168

(Total for Question 26 is 4 marks)

27 (a) Write 0.00562 in standard form.

Multiplying by ten 3 times gives 5.62, which is at least 1 and less than 10. It must be multiplied by 10^{-3} to keep it equal

5.62×10^{-3}
(1)

(b) Write 1.452×10^3 as an ordinary number.

Typing it into the calculator converts it to an ordinary number

1452
(1)

(Total for Question 27 is 2 marks)

28 Here are the first five terms of a Fibonacci sequence.

3 3 6 9 15

(a) Write down the next two terms of the sequence.

To get the next term, add together the previous two terms. $9 + 15 = 24$ then $15 + 24 = 39$

..... 24 , 39
..... (1)

The first three terms of a different Fibonacci sequence are

a a $2a$ $3a$ $5a$

(b) Find the 6th term of this sequence.

To get the next term, add together the previous two terms. $a + 2a = 3a$ then $2a + 3a = 5a$ then $3a + 5a = 8a$

..... 8a
..... (2)

(Total for Question 28 is 3 marks)

29 $\mathbf{a} = \begin{pmatrix} 4 \\ 5 \end{pmatrix}$ $\mathbf{b} = \begin{pmatrix} 3 \\ 2 \end{pmatrix}$

Work out $\mathbf{a} - 2\mathbf{b}$ as a column vector.

$4 - 2 \times 3$ ← Working out the x-component by substituting in the x-component of \mathbf{a} and x-component of \mathbf{b} into $\mathbf{a} - 2\mathbf{b}$

$5 - 2 \times 2$ ← Working out the y-component by substituting in the y-component of \mathbf{a} and y-component of \mathbf{b} into $\mathbf{a} - 2\mathbf{b}$

$\begin{pmatrix} -2 \\ 1 \end{pmatrix}$

(Total for Question 29 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS